North Coastal Watersheds Five-Year Action Plan

Prepared for the Massachusetts Executive Office of Environmental Affairs

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http://www.NorthCoastal.net

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Dear Friends of the North Coastal Watersheds:

It is with great pleasure that I present you with the 5-Year Watershed Action Plan for the North Coastal Watersheds. The plan will be used to guide local and state environmental efforts within the North Coastal Watersheds over the next five years. The plan expresses some of the overall goals of the Executive Office of Environmental Affairs, such as improving water quality, restoring natural flows to rivers, protecting and restoring biodiversity and habitats, improving public access and balanced resource use, improving local capacity, and promoting a shared responsibility for watershed protection and management.

The North Coastal Watershed Action Plan was developed with input from the North Coastal Watershed Team and multiple stakeholders including watershed groups, state and federal agencies, Regional Planning Agencies and, of course, the general public from across the Watershed. We appreciate the opportunity to engage such a wide group of expertise and experience as it allows the state to focus on the issues and challenges that might otherwise not be easily characterized. From your input we have identified the following priorities:

- Open Space: Foster Sustainable Development
- Habitat: Conserve habitat and wildlife
- Water Quality: Improve water quality and water-related human health
- Water Quantity: Better water management / flood control
- Recreation: Foster recreational use of natural resources and economic growth related to recreation
- Outreach: Local capacity building, outreach, and education

I commend everyone involved in this endeavor. Thank you for your dedication and expertise. If you are not currently a participant, I strongly encourage you to become active in the North Coastal Watersheds' restoration and protection efforts.

Regards,

Ellen Roy Herzfelder

Ellen Roy Herzfelder

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EXECUTIVE SUMMARY

This 5-Year Watershed Action Plan will serve as the strategic environmental planning document for the North Coastal Watersheds (NCW) Team for calendar years 2004-2008. It is intended to provide a long-term vision for the watershed and to describe a set of overall goals and objectives. The goals of the NCW team and the Action Plan are:

1. **Open Space:** Foster Sustainable Development (people-oriented).
2. **Habitat:** Conserve habitat and wildlife (nature-oriented).
3. **Water Quality:** Improve water quality and water-related human health.
4. **Water Quantity:** Better water management / flood control.
5. **Recreation:** Foster recreational use of natural resources and economic growth related to recreation.
6. **Outreach:** Local capacity building, outreach, and education.

The Action Plan was developed in conjunction with representatives of a wide array of public watershed interests, via input at public meetings, on a website (www.NorthCoastal.net), through newspaper articles, and through videotaping at public events. The Action Plan identifies existing conditions and unresolved issues, and then develops priorities for action.

The Action Plan recommends concrete actions for the next five years to work towards those goals. Formerly, EOEA's Massachusetts Watershed Initiative would have overseen the implementation of the Action Plan. With the dissolution of that Initiative, implementation will be accomplished in a more decentralized manner – primarily via local watershed groups, with some oversight and input from EOEA and other Watershed Team representatives. For the NCW, the Watershed Team still meets, as an information-sharing source for its constituent watershed groups, and EOEA continues to embrace the Watershed Initiative's goals and methods via the NCW Watershed Team. The Action Plan in that context becomes a reference source for use in grant applications by the local watershed groups. The recommendations of this Action Plan are:

- A. Study and rehabilitate closed coastal shellfish beds
- B. Initiate and develop a salt marsh recreational and ecological survey
- C. Reinstitute beach maintenance & develop area beach management plans
- D. Expand river and lake cleanups
- E. Publicize and reduce contaminated stormwater runoff
- F. Restore and Protect Water Quality/ Reduce Pathogens
- G. Protect, evaluate, and restore sensitive habitat
- H. Maintain natural water flow regime
- I. Restore anadromous fish habitat
- J. Watershed-wide flood planning
- K. Watershed-wide open space planning
- L. Preserve and protect farmland
- M. Implement the Grow Smart North Shore Open Space Plan
- N. Direct outreach to communities / build sense of stewardship
- O. Liaison for grant opportunities
- P. Meet watershed goals via other projects

The protection and restoration of the North Coastal Watersheds' resources will take the combined efforts of many communities: citizens, local governments, environmental groups, state and federal agencies, and business. The success the Watershed Team has in bringing these communities together will in large part determine the success of the North Coastal Watersheds Action Plan. The 5-year Watershed Action Plan should thus be considered "a living document" that will change as new issues and needs are identified, and new partners join the Watershed Team.

The results of the Action Plan include a 30-minute video intended for distribution to high schools, libraries, and local cable TV stations. For those interested in reading more than the brief video can provide, this Action Plan will be distributed to the same locations.. In addition, the website www.NorthCoastal.net contains a record of numerous public input as well as a reference library of numerous relevant documents. That website will be maintained indefinitely.

1. INTRODUCTION

1A. NORTH COASTAL WATERSHEDS: Physical and social setting

The North Coastal Watersheds (NCW) encompasses a growing coastal region north of Boston. The NCW spans 27 cities and towns, an area defined by its primarily coastal influence, with several small rivers that drain directly into the ocean, rather than the more common watershed definition surrounding one large river.

Ecoregions

Many people only envision the land divided by its political boundaries, such as the states of New England or Massachusetts' 351 cities and towns. However, the land can also be divided by its geology, hydrology, climate, and the distribution of its flora and fauna into physiographic divisions and biological ecoregions.

The North Coastal area is contained within two ecoregions; the Southern New England Coastal Plains and Hills (from Salem Sound northward) and the Boston Basin (including the Saugus River and southward, extending beyond the North Coastal Watersheds). The Southern New England Coastal Plains and Hills consist of low rolling hills with a range of generally acidic soil types. Various estimates by experts place the number of *natural communities* and rare species and habitats at roughly 150.

The Boston Basin is almost entirely urban and suburban in character with relatively few *natural communities*. Three major rivers drain into the Boston Basin (south of the North Coastal Watersheds) and the

Saugus River drains the ecoregion along its northern boundaries. Experts place the number of *natural communities*, rare species and habitats within the Boston Basin at 38.[1]

The NCW has been described as a study in contrasts, marked by extensive areas of open space, rural towns and highly urbanized communities with all or portions of 27 communities dispersed over its 168 square miles. The glacial history of the area combined with the low relief has resulted in the formation of numerous wetlands, lakes and ponds and swamps along the main river valleys through out the watershed. The topography of the watershed is characterized by small hills, which reach altitudes of about 350 feet above sea level, and low stream gradients. The rivers within the watershed are comparatively small, tidal and historically have been heavily exploited. Some of the major rivers are the Essex, Annisquam, Danvers, Saugus, Pines, and the North River. The Watershed is "naturally" divided into subregions: The Saugus/Pines River Estuary, Nahant Bay, Salem Sound, Cape Ann, and portions of Salisbury and Amesbury.

Physical Features

Barrier islands and salt marshes: Starting in the northern reach of the watershed, portions of the extensive Hampton and Seabrook Marshes of southern New Hampshire extend southward into Amesbury and Salisbury. Barrier island beaches make up a significant portion of the North Coastal Watersheds coastline and include Salisbury Beach, Cranes Beach, Wingaersheek, and to the south, Revere Beach. The salt marshlands located behind these barrier islands are extensive. Of particular value is the 15,000-acre Great Marsh that extends over portions of four watersheds including the Merrimack, Parker, Ipswich, and North Coastal (the Cape Anne portion of NCW). The Great Marsh is the largest contiguous salt marsh north of Long Island, New York.

Saugus River: Notable features within the southern reaches of the watershed include Reedy Meadow, a distinctive 540-acre freshwater marshland, which along with Lake Quannapowitt (in Wakefield) form the headwaters of the Saugus River. At the mouth of the Saugus is the equally important 900-acre Pines River/Saugus River Marsh locally known as Rumney Marsh.

Rocky peninsulas: The predominant shoreform of the North Shore coastline consists of rocky peninsulas interspersed with embayments, pockets of salt marsh, and estuaries (drowned river valleys) fronted offshore by rock islands. Cape Ann provides Massachusetts with some of its most distinctive rocky coastline.

Lakes and ponds: Within the NCW boundaries there are a total of 85 lakes and ponds, 39 of which are greater than 10 acres. Lake Quannapowitt in Wakefield is the largest at 254 acres followed by Chebacco Lake in Essex at 209 acres. Twenty of the lakes and ponds have been designated either as Outstanding Resource Waters per (314 CMR 4.00) or as Areas of Critical Environmental Concern (ACECs) per MGL Ch. 21A § 2(7). Lake Wenham (on the Beverly-Wenham line) is hydrologically outside the watershed, but is included in this study because it is a major source of drinking water for the watershed.

Water quality: The DEP DWM has conducted water quality surveys in the NCW since 1975, most recently in 1997-1998. The previous surveys were conducted in 1987-1988 for Salem and Beverly Harbors and their tributaries, Salem Sound and Marblehead Harbor, Manchester Harbor, Gloucester Inner and Outer Harbors and a segment of the Annisquam River. Data from the 1987 survey indicated that high coliform bacteria densities and/or low dissolved oxygen impaired the North River, Goldthwait Brook, South River Channel, Crane River, Bass River, Salem Sound (at the WWTP outfall) and several coves of Inner Gloucester Harbor. Results of the 1988 survey indicated that the waters of the NCW generally did not support their designated uses.[2] Twenty-five waterbodies within the North Coastal Watersheds, both fresh and marine are listed on the Federal 303d list of impaired waters (see Appendix F). The comprehensive 1997/1998 survey[3] focused on water quality and fishery resources. It included:

- Water chemistry measurements and detailed nutrient analyses at river and marine stations on 18 dates
- Survey of soft-shell clam habitat
- Summarized available catch data for recreational and commercial fisheries
- Limited comparisons were made of the study results to the 1965 DMF estuarine study of Salem Sound.

[1] BioMap Guiding land conservation for biodiversity in Massachusetts NH&ESP, MDF&W 2001.

[2] MA DEQE 1989

[3] See "The Marine Resources of Salem Sound 1997" , published 2002 by the Massachusetts Division of Marine Fisheries. Abstract and contact information at http://www.mass.gov/dfwele/dmf/programsandprojects/salemsnd.htm

Resource industries: The abundance of open beaches, coastal wetlands and harbors are used by residents and non-residents in support of a host of outdoor recreational activities including swimming, fishing, boating, hiking, and hunting. The dominant *resource industries* include commercial fishing for finfish, lobsters and shellfish particularly within upper North Shore communities of Essex, Ipswich and Gloucester.

Social Setting

One of the NCW's foremost assets is its "quality of life." This asset is derived from the unique juxtaposition of historic towns, intact open spaces and neighborhoods with densely populated urban areas. However, in a recent survey,[4] NCW residents responded that:

- The most important problem facing their community today is development and "sprawl" (42%);
- "Too much development" is the primary concern (44%), especially around traffic issues (30%);
- The quality of life has gotten worse in the last 3 years (46% "worse" versus 21% "better").

After nearly 400 years of intensive human influence, the NCW's resources, while not always pristine, provide home to nearly 500,000 people, support vibrant communities with clean drinking water and a diversity of natural, historic and recreational opportunities. Today the character and resources of this watershed are under increasing threat from "low density sprawl." Habitat fragmentation is considered by many to be one of the most serious threats to maintaining biological diversity. The watershed's natural resources are increasingly being required to serve a multitude of conflicting uses.

Subregions of the NCW face unique sets of issues. Addressing the numerous, diverse and often competing problems across the watershed requires a range of solutions. In the non-sewered areas primarily to the north in Gloucester and Essex, the main issues are:

- controlling and managing growth;
- concerns with enforcement of regulations controlling subsurface waste disposal (Title V);
- excessive demands on local water supplies; and
- closed shellfish beds.

In the Salem Sound area concerns are primarily:

- nonpoint source pollution on Salem Sound's streams and coastal waters
- degraded recreational and commercial coastal resources, i.e., contaminated fishing areas, closed shellfish beds, beach closures, and invasive species;
- maintaining and enhancing open natural spaces, i.e., estuaries, stream buffers and forests;
- protecting and conserving the drinking water supply;
- fostering sustainable growth and redevelopment.

Problems facing the Saugus River and Nahant Bay/Broad Sound systems include:

- water shortages;
- low flows in the Saugus river;
- flooding;
- Combined Sewer Overflows; and
- closure of public beaches due to bacterial contamination.

The primary concerns in the Salisbury area relate to:

- controlling and managing growth;
- enforcement of regulations controlling subsurface waste disposal (Title V);
- localized flooding and coastal erosion; and
- the closure of shellfish beds.

[4] Boston Metropolitan Area Planning Council survey, referred to as "MAPC survey." The MAPC area includes 101 towns with overlap to NCW. The MAPC survey was conducted on-line within NCW via the *Salem News* and the *Gloucester Times*. The partial survey results were downloaded as of May 20, 2004, prior to survey completion, to meet publication deadlines. 767 people responded from NCW towns. A table of the downloaded results appears in Appendix M.

1B. HISTORICAL CONTEXT

The North Coastal Watersheds are a place "where people have always wanted to live." Since its earliest beginnings people have moved into and occupied the land. For thousands of years, the relationship of the Native American populations to their environment revolved around the wheel of the seasons.

Pre-industrial agriculture: A dramatic change in land use occurred in the 1620s with the arrival of European settlers who were attracted in part by the area's abundant and varied natural resources. This period saw the replacement of the traditional native seasonal village system, with its shifting agriculture and its hunter/gatherer activities, to permanent villages employing agricultural practices that raised crops and managed domesticated animals. Ultimately, English property systems encouraged colonists to regard the products of the land and sea, not to mention the land itself, as commodities. Over time as the population of colonists increased, the resources in their immediate reach became depleted. However there existed a seemingly endless bounty of new and unexploited resources. The rural economy of New England thus acquired a tendency toward expansion.[5]

Industrialization: America's Industrial Revolution began in Massachusetts and neighboring Rhode Island. The development of mills powered by water transformed many of the Commonwealth's water bodies by converting them from free flowing to impoundments with controlled releases. By the early 19th century, the North Coastal area became one of the nation's major centers for shipping, shipbuilding, and trading with Europe and Asia. During the latter half of the 19th century, the creation of modern industrial infrastructure made possible the formation of large industrial-based cities such as Lynn, Salem, and Peabody. Industrialization also spurred the growth of the fishing industry as railroads and later the road systems allowed the shipment of fresh fish to inland markets. The industrial economy placed immense stresses on the environment as factories and municipal sewage systems discharged huge concentrated flows of all forms of waste into the waters of the Commonwealth. By the 1870's deforestation reached its peak with only 10% of the state remaining under a wooded condition. The integrity of the region's abundant and remarkably diverse collection of natural resources, working landscapes, historic villages, cities and towns became increasingly threatened due to over-exploitation, pollution, and an ever-increasing population.

Conservation: During this same period of industrialization, the North Shore's scenic coastline and abundant natural resources attracted an increasingly mobile public, becoming one of Americas' first summer resorts. The combination of environmental pressure and public interest sparked some of America's earliest conservation activities. Visionaries such as Alice Town Lincoln and Charles Eliot sought to guard against indiscriminate development, to protect scenic and historic places, and established protective institutions such as The Trustees of Reservations, the first land trust in the world, established in 1891. Changes internal and external to New England brought about significant changes as the major industries of tanning, shoe making and chemical manufacturing closed or departed for other areas.

Suburbanization: While the North Shore has been historically one of the slower growing areas, its exceptional scenic and cultural resources are now threatened by unplanned patterns of growth. In the 1950s through 1980s much of the region evolved into a suburb of Boston, as commuter rail service and highway construction linked the North Shore with Boston and to the rest of the nation's population centers. Recently the North Shore has since become increasingly attractive as bedroom communities for the region's burgeoning high tech industries.

Sprawl: A host of new changes and threats are currently presenting themselves. Often referred to as "sprawl," unplanned growth results in a decentralized and incoherent pattern of development that consumes large amounts of open space, overburdens existing infrastructure and resources, and damages our environment. Between 1950 and 1990, the population of Massachusetts grew by only 28% while the amount of developed land grew by 188%. Sprawl usually results in the abandonment of our historic urban and village centers accompanied by the consumption of land for poorly planned development in our growing suburbs and rural communities. The negative impacts of sprawl on our communities extends beyond the aesthetic. Sprawl affects quality of life in ways that are both alarming and often irreversible, including:

- the destruction and fragmentation of important wildlife habitat;
- increases in traffic and air pollution;
- water supply degradation due to polluted runoff from paved surfaces and disturbed soils;
- water shortages in our rivers, streams, ponds and aquifers as groundwater recharge areas are developed; and
- an increase in local taxes to pay for greater infrastructure such as sewer lines and school buildings.

[5] excerpted from *Changes in the Land*, W. Cronon, 1983

Clearly, sprawl is a direct threat to the quality of our water and air, the beauty of our landscape and the character of our communities. It also jeopardizes our long-term economic well-being by squandering natural resources needed to support economic development while increasing the cost of infrastructure and community services. As housing tracts and strip malls replace open spaces and critical wildlife habitats, resource-based industries, such as farming, forestry, fishing, tourism, and recreation also suffer. Ironically, as the impacts of sprawl accumulate, communities may begin to react negatively to growth proposals and foster "anti-growth" sentiments in which innovative, appropriately sited and economically beneficial development projects are spurned or discouraged. Our natural resources are limited and physically finite yet are increasingly being required to serve a multitude of conflicting and competing uses. The key to protecting the NCW's exceptional natural and cultural heritage is ongoing interaction between environmental stewards, government representatives, and the general public.

1C. THE MASSACHUSETTS WATERSHED INITIATIVE

Formerly, EOEA's Massachusetts Watershed Initiative (MWI) would have overseen the implementation of the Action Plan. With the dissolution of that Initiative, implementation will be accomplished in a more decentralized manner – primarily via local watershed groups, with some oversight and input from EOEA and other Watershed Team representatives. For the NCW, the Watershed Team still meets (on a monthly basis at the Mass Audubon headquarters in Beverly), as an information-sharing source and funding-opportunity source for its constituent watershed groups. EOEA lauds the Team members for doing so on their own initiative, and directs interested parties to contact them (see list in Appendix B).

Despite the organizational changes at EOEA, the principles of watershed management are still adhered to by EOEA and the continuing development of watershed based action plans underscores that commitment. The ultimate goal, the improvement of the environmental health of all 27 watersheds, is just as achievable today as at any other time. The principle of shared responsibility for our watershed health was a key element of the Initiative and remains critical to the success of any watershed based action plan. This watershed action plan is designed to outline those priorities for adoption not only by government organizations but businesses and private citizens as well.

The Initiative achieved a major milestone by bringing together local citizens, government representatives and active environmental organizations. These stakeholders' continuing interaction provide testimony to their commitment for watershed health and proof that people can work together to face the watershed issues they share. Moving forward on their recommendations made in this Plan will prove their ability to make significant improvements without the need for continuing state intervention.

Many funding programs, sponsored by the Commonwealth and others, remain to support these local efforts – details appear in Appendix G. EOEA remains committed to improving and supporting watershed health throughout the Commonwealth. More details concerning the previous functioning of the Massachusetts Watershed Initiative appear in Appendix A1. It is the intent of this document to be utilized as a strategic planning document for the North Coastal Watersheds Team and its constituent members for calendar years 2004-2008.

The priority project list represents the Watershed Team's consensus judgment on projects that should receive prioritized funding through the various funding mechanisms available to local watershed groups. The goal is to facilitate locally based problem identification and problem solving and coordinate implementation activities among all parties. The specific program goals of this action plan are (with their corresponding MWI program elements):

1. **Open Space:** Foster Sustainable Development (people-oriented).
2. **Habitat:** Conserve habitat and wildlife (nature-oriented).
3. **Water Quality:** Improve water quality and water-related human health.
4. **Water Quantity:** Better water management / flood control.
5. **Recreation:** Foster recreational use of natural resources and economic growth related to recreation.
6. **Outreach:** Local capacity building, outreach, and education.

2. ISSUES AND STRATEGIES

In this section we outline the issues and strategies for each of the six goals. The purpose is to introduce the issues and strategies, to provide context for the prioritizations in Section 3. More details on the issues appear in Appendix C, "Issues Background." The previous round of goals appears in Appendix D. Corresponding previous accomplishments appear in Appendix E.

2A. Open Space: Sustainable Development

Goal 1: Foster Sustainable Development (people-oriented)

Issues: The *Grow Smart North Shore* report serves as the NCW comprehensive Open Space plan. It is available on the NCW website, www.NorthCoastal.net .

The more general goal of sustainable development raises numerous transportation-related issues. The Blue Line (MBTA) is proposing to expand through Rumney Marsh to Lynn; and a reconstruction project of Rt. 1 is planned. Both construction projects will potentially impact the ACEC area and other parts of Rumney Marsh.

Strategies Several years ago the Metropolitan Area Planning Council (MAPC) and its North Shore Task Force (NSTF) sponsored a Harvard School of Design project to investigate the potential to create a metropolitan open space system for the Greater Boston Metropolitan region and adjoining areas of Eastern Massachusetts. The final report entitled *Mass Bays Common* proposed a network of large protected natural resource systems. As a natural progression from this larger effort, the NSTF commissioned a similar effort for the 15 communities in the North Shore area. The report entitled *Grow Smart North Shore* proposes:

- a network of interconnected existing preservation areas, new preservation areas, riparian corridors setbacks and a harbor walk as the means to consider the needs and character of the region's resources and people;
- address the needs of the regional ecology; address the issues of water quality and quantity; address the rich cultural heritage of the region; and
- create a realistic, regional open space reserve on the North Shore and Cape Ann.

Several NCW team members were active in the formulation of this project and the subsequent presentations to local officials and the public. It was the consensus of the team that *Grow Smart North Shore* could effectively serve as the NCW comprehensive Open Space plan. Planning for growth and community preservation has been an active component of the Watershed Team's activities.

"Open Space Residential Design" (OSRD) is a rezoning method intended to implement greater open space within the same population density. Numerous documents on OSRD methods, bylaw changes, and zoning concepts are included on the website, under the heading of "Conservation Subdivision Design."

Some NCW team members were active in programs to support local agriculture on the North Shore and Cape Ann, that protects farmland as wildlife habitat, as open space, and as cultural and historic resources.

2B. Habitat Conservation

Goal 2: Conserve habitat and wildlife (nature-oriented)

Issues The long history of development and alteration within the watershed has placed much of the natural resources at risk. The Team has identified as a priority the restoration of degraded wetlands and the reopening of productive shellfish resources. Estimates compiled for the EOEA 2002 Report "*The State of Our Environment – A Special Report on Community Preservation and the Future of our Commonwealth*" indicate that the Commonwealth will have about 9.75 million people at buildout, or about 3.5 million more than today. Massachusetts is zoned for an additional 2.4 billion square feet of commercial and industrial growth at buildout. This is the equivalent of about 17,000 Wal-Marts.

The primary concern is that the ongoing land fragmentation, resulting from continuing economic development, more specifically housing growth, will seriously endanger the biodiversity within the Commonwealth and the North Coastal Watersheds. The Natural Heritage Program of the Division of Fisheries and Wildlife examined the entire landmass of the Commonwealth, reviewed all existing data on the native species that live in

Massachusetts, and produced a map that identifies those areas that need to be preserved and managed. The BioMap[6] places some 40 natural communities within the NCW at risk.

Strategies The extensive alteration of the waterbodies and landscapes within the watershed often precludes the ideal application of land acquisition and establishment of protected conservation easements. Often these sensitive habitats require the imposition of remedial measures to restore some of their biological and ecological functions to better reflect a more natural condition.

- ? The NCW team is generally supportive of the concept of "The Natural Flow Regime."[7] This approach recognizes the importance of natural streamflow variability in maintaining healthy aquatic ecosystems.
- ? Integrate the concept of biodiversity into the MWI program elements (which are still supported by EOEA).
- ? Promote a thorough review and study in and around both surface and groundwater water supplies to insure that drawdowns needed for water supply protection cannot be so great that they wipe out the wetlands and in-stream flows to maintain biodiversity.
- ? The NCW team will support on-going projects and foster new projects in the watershed targeted to restoring or remediating degraded streams, wetlands, reopening productive shellfish beds and promoting conservation of eelgrass beds.
- ? In the past, support has largely been in the form of site assessment and the writing of endorsement letters to the various funding sources. However, future projects do not preclude involvement in active restoration or remediation projects.

2C. Water Quality Improvement

Goal 3: Improve water quality and human health issues

Issues: The waters within the North Coastal Watershed generally do not support their designated uses. Water quality problems are pervasive throughout the watershed often the result of cumulative impacts from point and nonpoint sources. The most likely causes are exceedances of standards for bacterial contamination excessive nutrients/low dissolved oxygen, invasive species and priority pollutants. A complete list of NCW impaired waters appears in Appendix F (updated as of 2002, with older lists for reference).

Sections of the North Coastal watershed have extensive areas of impervious surfaces created by dense housing developments, roads and commercial parking areas. The runoff from these areas alters the water quality and biological integrity of areas once noted for anadromous fish runs, swimming and shellfishing. In the more urbanized areas of the NCW, particularly in the Salem Sound and Saugus River subwatersheds, contaminated urban sediments is also an issue.

Thermal discharges from two major NPDES permittees located on opposite shores of the Saugus River Estuary may adversely impact fish migration as well as egg and larval development. A total of 25 waterbodies both fresh and marine are listed on as impaired waters (DEP 1996 303d list) (See Appendix D).

The North Coastal Watershed has five municipal sewage treatment facilities and several large industries, all of which are classified as major dischargers under the NPDES permitting program. Record keeping and updates on the actual number and status of minor NPDES permits needs to be updated. DEP/DWPC/NERO was responsible for overseeing a number of Administrative Consent Orders filed against municipalities and business for noncompliance with both State and Federal Water Quality Laws and Regulations. Changes in program management and personnel had lead to a lack of "up to date oversight."

Human health issues relate not only to water quality but to air quality as well. Several community members cited air emissions as a potential cause of illness. While this report focuses on water-related issues, the comment section of the website and the associated video include discussions of other health issues.

Hence the term "health" in this category means both human health and healthy aquatic systems. That includes anadromous fish issues, for example. This category should be interpreted broadly, to include aesthetics as well.

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[6] which is tied to the aforementioned Massachusetts Ecological Regions Project: *Griffith, Glenn E. et al., for U.S. Environmental Protection Agency and Massachusetts Department of Environmental Protection, Corvallis, 1994*

[7] LeRoy et al, 1997, Richter et al 1996

Strategies: Develop a plan and financing to supplement the monitoring efforts of DEP/WSM, DMF, SSCW and SRWC by engaging additional partners, providing communication linkages between the respective programs and expanding the list of water quality parameters.

? Provide direct technical assistance for DEP/DWPC/NERO compliance activities by the collection of water quality samples, biological assessments and flow measurements.

? Promote the coordination and pooling of all federal, state and NGO efforts and tailor some of the sampling. This would enhance the individual group efforts towards meeting their targeted goals and provide a more comprehensive assessment of conditions within these targeted areas.

? Find resources to assist DEP and EPA in the review and comment of compliance reports, daily reporting requirements, and previous studies, update files and follow up on previous permit recommendations and requirements to issue protective NPDES permits for the nine major NPDES permittees.

? NPDES permits should contain specific limits and monitoring requirements for pollutants that impair water quality. The limits should be set so that the receiving water meets applicable water quality standards.

? NPDES permits should conform to EPA's guidance document: Watershed-Based - National Pollutant Discharge Elimination System - (NPDES) Permitting Implementation Guidance - August 2003 - Draft

? Develop and implement a plan to provide subwatersheds with comprehensive condition assessments and plans to maintain or improve the water quality and quantity.

? EOEA should issue its Revised Water Policy as soon as possible.

? The EPA's TMDL loading limits, while sometimes criticized as onerous, do provide specific numeric goals for demonstrating water quality improvement. The Watershed Team in the past identified four subwatersheds in which to target efforts and resources – they were selected on the basis of being dispersed across the watershed; because they had common problems, and because they had active group(s) of communities in support; and because progress and improvements are readily demonstrated.

2D. Water Quantity Management

Goal 4: Better water management / flood control

Issues The NCW does not have a unified water supply or well field located within the watershed. A number of communities have access water rights to the Ipswich River. Some communities can also access water from Massachusetts Water Resources Authority (MWRA) and from privately owned wells. The numbers and locations of private wells and amounts withdrawn are not well documented. Droughts have plagued the region in the past.

The high population density places demand on the water supply resources in the drainage basin, even though several municipalities actually derive their water supply from surface or groundwater sources outside of the North Coastal Watershed. Projected water demand at buildout for municipalities will exceed presently permitted supply by 12,600,000 gallons per day (gpd). Data compiled from (EOEA 2002 *The State of Our Environment* – A Special Report on Community Preservation and the Future of our Commonwealth).

An area of significant concern is the Saugus River, a system that is affected by low flow conditions caused in part by registered and permitted water withdrawals by the Lynn Water and Sewer Commission. Water is diverted from the Saugus River mainstem into Hawks Pond, part of the LWSC Water Supply Reservoir system. Permitted and registered withdrawals of 10.21 MGD by the City of Lynn and a permitted withdrawal of 0.28 MGD by the Colonial Golf Course in Lynnfield contribute to a section of the Saugus River being dry (Cashins 1997).

The town of Rockport is seeking to expand its water supply by the establishment of a new reservoir and the diversion of three intermittent streams.

Salisbury officials are concerned that large scale withdrawls by neighboring Seabrook NH maybe impacting Salisbury wellfields

Strategies:

? DEP/Drinking Water Supply personnel need to update files and permits issued to all registered water users.

- ? Develop and implement a plan to protect watershed lands around water supplies. But the drawdown needed for water supply protection cannot be so great that they wipe out the wetlands and in-stream flows that maintain the Commonwealth's biodiversity. Watershed plans must employ a better balance between public water supply demands and designated uses such as Aquatic Life.
- ? Water suppliers need a program to help them in securing funds for Watershed Protection.
- ? Encourage public water suppliers and DEP regulators to implement water conservation measures such as leak detection installation and calibration of water meters. While providing a valuable resource to the communities at great cost savings, water conservation measures also help communities meet one of the general water conservation practices under their Water Management Act permits.
- ? Develop and implement a flow monitoring program to provide accurate and reliable data on flows in most of the subbasins. Subwatershed assessments and plans are needed to provide the basis for protecting these resources.
- ? Suggest inclusion of flow monitoring as a standard parameter during all water quality assessments.

2E. Recreation as Economic Resource

Goal 5: Foster recreational use of natural resources and economic growth related to recreation.

Issues: The team had not previously identified the element of recreation as a specific priority issue to be addressed by the team. Often it is embedded or included in open space planning and habitat issues. It is currently included because of the large number of people who participate in water-based recreation in the NCW area and because of the large number of public comments that were recreation-related.

In particular, the NCW includes several of the Boston area's most popular beaches (Revere Beach, Singing Beach in Manchester, Crane's Beach in Ipswich, Salisbury Beach, etc.) In terms of fresh water, the NCW contains several large lakes (Lake Quannapowitt in Wakefield, Chebacco Lake in Essex) which are potentially available for recreation.

Strategies. Because of the many popular beaches in the NCW, the Watershed Team includes economic issues in this section as well. High-use beaches provide financial resources for local communities, but in addition, the recreational benefit accrues to local residents directly. More usable beaches and waterways provide greater recreational benefit – and many of the best recreational resources in NCW are degraded. Their improvement would have an immediate economic benefit and could be the basis of several economic studies. For example, cleaning Lynn's coastal waters sufficiently to reopen the shellfish beds would provide a local recreational activity (clamming) which was the tradition for decades. Some past activities at the local level in this area include:

- ? In 1999, the Watershed Team participated in a series of workshops and presentations with DCR (DEM) and Salem State College on a study of Chebacco Lake.
- ? Beginning in 1999, the **Friends of Lake Quannapowitt** has held a watershed awareness program with an outdoor classroom for all children that graduate the public school system.
- ? In 2003, the Chebacco Lake Association wrote a series of articles in the Hamilton-Wenham Chronicle to publicize the issues about the lake. The lake has high mercury levels and problems with noxious plants including nonnative plants (fanwort).
- ? While the two goals of clean beaches suitable for swimming and shellfishing is admirable, the two activities are not compatible in the same time period. Water quality monitoring and publicizing the results as well as sanitary surveys by MDMF can make this a reality.

2F. Capacity Building & Outreach

Goal 6: Local capacity building, integration between groups, outreach, and education

Issues: The North Coastal Watershed enjoys an active citizenry often organized at the local level and generally dealing with specific or regional environmental issues. It was discovered that there is no single environmental issue affecting all of the citizenry—rather, the issues and concerns are localized. Virtually all of the environmental agencies under EOEA have a significant presence in the watershed. Communication between the various levels of government, sister agencies and local community partners is inconsistent. The Department of Environmental Protection through its

regulatory authorities plays a central role in protecting and improving environmental conditions for a host of issues, such as water pollution control, wetlands protection, water supply, solid waste management, and hazardous waste management. Particularly successful at interacting at the grassroots level were, DFG (DFWELE) through their Stream Team Program and **CZM/NS** which provides proactive leadership and assistance in growth management, outreach programs and grants management.

Three Local Governance Committees (LGCs) **Salem Sound Coastwatch (SSCW), Eight Towns and the Bay (8T&B)**, and **Metropolitan Boston Local Governance North Shore** were organized under the Massachusetts Bay National Estuarine Program during the 1980's and 1990's. The LGC's missions differ in response to the directives of their core constituency. The **Saugus River Watershed Council (SRWC)** founded in 1991 and **Save Waters in Massachusetts (SWIM)** have established regional constituencies. The Essex County Buy Local program promotes local agriculture and education about buying locally. In addition there are many other smaller constituent groups. Limitations in technical expertise, personnel, or inconsistent funding hamper their ability to address complex problems. The diverse nature of the watershed sometimes works against them, since they often must compete for funds or resources.

Strategies: Identify the *communities* working in the North Coastal Watersheds. Channel outreach and education efforts through the local governance organizations and environmental groups, strive to develop a pattern of reciprocal communications. Model outreach efforts employed by DFG (DFWELE), **Massachusetts Audubon Society** and **CZM/NS** to fit NCW needs. Maximize the exchange of information between team members and collaborative through electronic mail systems. As contacts are established with local officials invite them to join the team. Prioritize problems within the sub-regions, map out strategies to effect positive change, solve problems at the sub-watershed level and make the North Coastal Team relevant to the needs of all constituencies.

Rather than focusing on establishing a "NCW team identity", a choice was made to facilitate existing programs wherever possible and provide additional resources to supplement or augment existing *community* efforts:

- Support and encourage growth of local constituencies.
- Keep all groups apprised of appropriate grants and other funding.
- Encourage the development of working partnerships between team members.
- Provide letters of support for funding opportunities consistent with the watershed team's objectives.

Where possible, the watershed team will support local activities such as river clean-ups. In the opinion of the previous Watershed Team Leader[8], this was the single most effective outreach tool employed, when the watershed team was able to link this with evidence of anadromous fish spawning. This was the case in the North River cleanup, and with wildlife sightings in and around Town Line Brook – which resulted in validation of the volunteers' efforts and incentives for doing more.

The Watershed Team should consider itself the central information source for coordinating activities between local watershed and community groups. The NCW contains many such groups that would benefit from coordination, particularly information-sharing and funding source information.

As a result of this project, the NCW Watershed Team will produce a video about the watershed. It will be appropriate for periodic broadcasting on local cable stations, at high school environment classes. The intent is to distribute the video to libraries and high schools as a means of outreach.

Public Input Process

The public input detailed in Section 3, while topical and of interest to the public, does not necessarily reflect the views of the Watershed Team. In general, the public is much more concerned with health issues and recreational issues. Similarly, city and town officials are generally most concerned with local flooding and water flow issues. Watershed groups are generally most concerned with water quality issues and ecological issues.

Our recommendations attempt to reconcile the needs of all three groups. The most likely users of the recommendations, watershed groups, can interpret the recommendations about topics primarily of interest to the public as a means to improve public outreach.

[8] Larry Gil, communication of June 29 2004

3. PUBLIC INPUT

? The Watershed Team collected input from the Team members directly; from comments by members of watershed organizations at their meetings; from website comments solicited at meetings and in newspaper articles; from surveying newspaper articles in local newspapers; from videotaping at environmental events and at recreational sites; and from the previous version of the Action Plan draft.

? The issues were summarized into 117 specific tasks, or general concepts if a task was not yet defined. These 117 issues are listed in the following table. The issues are divided into topics for ease of reference only (the topics do not associate with the goals). Within each topic, the issues are listed alphabetically. The issues are numbered from 1 through 117 for ease of reference. Details about the issues can be found in Appendix C, as well as on the website www.NorthCoastal.net. In most cases, the website documents the source of the comments– readers should interpret any data which is undocumented in this report as from the website comments section.

? The Watershed Team determined the six goals of the Action Plan via discussions over a period of several months.

? Each of the 117 issues is evaluated as to how they fulfill each of the six goals. The members of the Watershed Team reviewed the evaluations to come to a reasonable consensus. The rating system is:

The issue has a **negligible effect** on the goal.
The issue has a **side effect** on the goal.
The issue has **some effect** on the goal.
The issue has a **direct effect** on the goal.
The issue has a **major effect** on the goal.

In addition to the six goals, each issue was evaluated on the same scale for "Level of Public Concern." This was measured by the number of citations of the issue. Since every issue was raised at least once in order to be placed on to the list, there are no "negligible" ratings for this column. We consider this category to be a proxy for the political importance of an issue. While we recognize that this method favors those who simply show up to address our meetings, or those who take the time to write a newspaper article, we also recognize that such activism is a valid measure of political support.

The final column is "Resource cost," which we use as a means of incorporating a cost factor or a factor for difficulty of implementation. The scale for cost is reversed, so that the more expensive or more difficult to implement an issue, the fewer points it receives. The "resource cost" means the additional cost to the Watershed Team, either financial or people's time. Hence if a task would be done anyway, there is a low cost of associating the NCW Team with that task. For issues where there is no specific task, we evaluate the cost for initiating a study, or for seeking funding for a study. The rest of the scale for resource cost is interpreted as:

Implementation is **prohibitively expensive** or prohibitively difficult.
Implementation is **expensive** or difficult, likely requiring a grant.
Implementation has a **reasonably inexpensive** or easy method.
Implementation is **inexpensive** and/or would require only adding to an existing project.
Implementation is being done anyway and hence has **no net cost** to the Watershed Team.

There are no point totals assigned to the evaluations, because the Watershed Team deemed that method of evaluation inappropriately specific. The discussion section following the grid discusses all the highly evaluated tasks as priorities – those issues best fulfill the stated goals of the Watershed Team. Of course, the evaluation system is somewhat arbitrary, so the prioritization is only loosely based on evaluations – it is intended for guidance rather than determining a sequence of priorities.

North Coastal Watershed Action Plan – Issues from Public Input

Goals ? vs. Issues ?

Waterways

1 Chebacco Lake cleanup
2 Hydrological study of North River
3 Ecosystem Restoration Project for Reedy Meadow and Saugus River – as part of GI RECONN proposal.
4 Implement Town Line Brook Watershed Restoration Project to restore habitat, improve water quality and address flooding.
5 Implement Phase II MS4 compliance in all municipalities in the watershed.
6 Implement recommendations of DEP's 1997/1998 Water Quality Assessment of the North Coastal Watershed
7 Lake Quannapowitt algae clean up
8 Lake Quannapowitt arsenic cleanup
9 More river/lake monitoring
10 Reissue NPDES permits with monitoring requirements included
11 Saugus River sediment study
12 SRWC river cleanup

Non-point sources

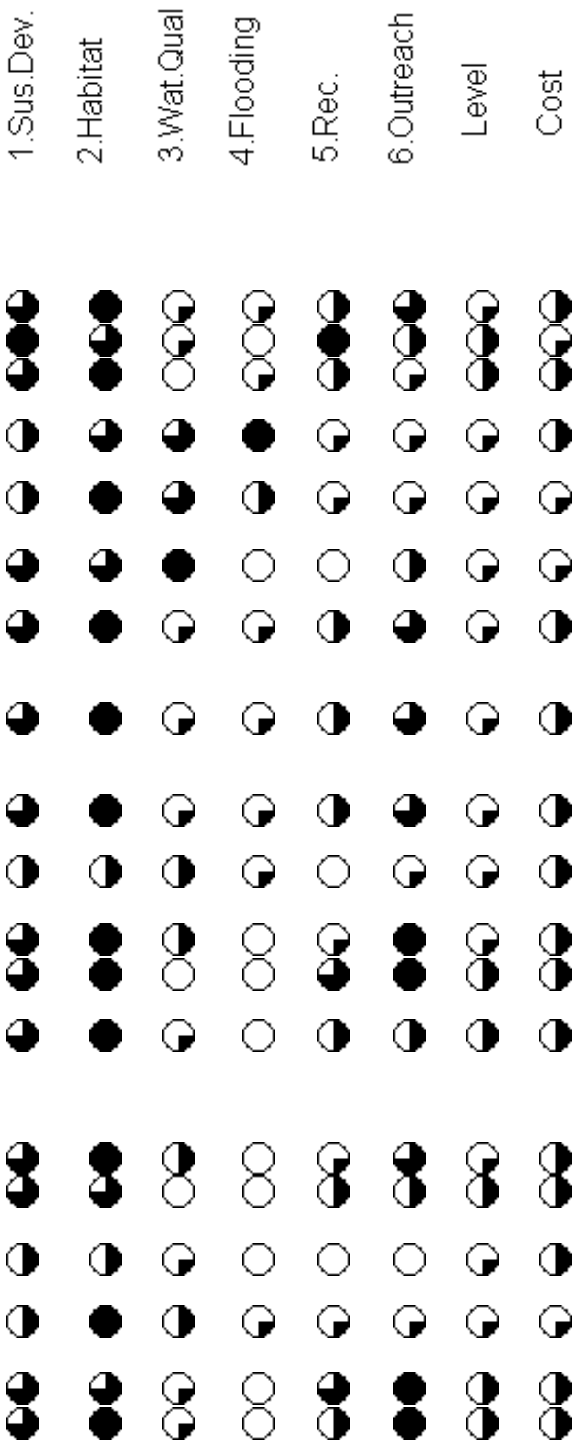
13 Contaminated runoff - fertilizer
14 Contaminated runoff - herbicide
15 Contaminated runoff - road salt
16 DDT in Swampscott lakes
17 Establish low road salt areas and safe salt storage locations within Saugus River watershed.

	Goals ? vs. Issues ?	1.Sus.Dev.	2.Habitat	3.Wat.Qual	4.Flooding	5.Rec.	6.Outreach	Level	Cost
Non-point sources (continued)									
18	Implement NPS BMPs within Town Line Brook subbasins								
19	Investigate and address sources of high bacterial pollution to Mill River								
20	Investigate and address sources of high bacterial pollution to Shute Brook, Saugus.								
21	Road salting study								
22	Removal of fly ash Wenham Lake								
Development									
23	Blue Line extension study								
24	Evaluate impact of windfarms								
25	Evaluate Linden Brook crossing under Rt1								
26	Health effects from Salem power plant emissions								
27	Promote locally -grown food (Essex County Buy Local, e.g.)								
28	Protect buffer zones to rivers, streams, marshes and other wetlands throughout Watershed.								
29	RESCO ash landfill - Ensure closure as required by DEP Consent Order.								
30	RESCO expansion study - Prevent expansion of waste incinerator within an ACEC								
31	Rt. 1 widening-effect on Town Line Brook								
32	Rumney Marsh canoeing survey								
33	Thermal discharge impact study in Saugus River estuary.								
Marine									
34	Assist MDMF in sanitary surveys of the Rumney Marsh shellfish beds								
35	"Take the Beach Back" in Revere; beach maintenance throughout the watershed								
36	Conduct study of marine resources in the Saugus River estuary.								
37	Implement Beaches Bill to provide timely monitoring and protect the public health.								

	Goals ? vs. Issues ?	1.Sus.Dev.	2.Habitat	3.Wat.Qual	4.Flooding	5.Rec.	6.Outreach	Level	Cost
***Marine** (continued)*									
38	Promote fishing rules								
39	Restore shellfish beds in Rumney Marsh/Saugus River estuary.								
40	Salem Sound boating - recreation economic analysis								
41	Shellfish bed - closure survey and/or economic study								
Wastewater									
42	Develop funding mechanisms for Phase II storm drainage improvements per Project # 01-09								
43	Eliminate CSOs in Gloucester - sewer separation								
44	Eliminate CSOs in LWSC - sewer separation								
45	Eliminate CSOs in LWSC - sewer separation								
46	Eliminate sewer discharges to Saugus River								
47	Monitor stormwater drainage from Stacy Creek onto MDC Kings Beach								
48	Upgrade drainage infrastructure of Saugus River downstream of LWSC Diversion								
49	Wastewater - Gloucester								
50	Wastewater - Nahant								
51	Wastewater - Revere								
52	Wastewater - Saugus								
Water supply									
53	Chronic flooding of Reedy Meadow								
54	Citizen members on Salem-Beverly Water Board								
55	Drinking water quality - Middleton Pond, Danvers								
56	Evaluate flooding control in Mill R.								
57	Flooding plans - Peabody								
58	Flooding plans - Revere								
59	Limited dredging of Town Line Brook for flood storage								
60	Monitor streamflow in the Saugus River.								

Goals ? vs. Issues ?	1.Sus.Dev.	2.Habitat	3.Wat.Qual	4.Flooding	5.Rec.	6.Outreach	Level	Cost
Water Supply (continued)								
61 Promote water conservation throughout Saugus River watershed.								
62 Reduce water withdrawals from Saugus River, particularly during fish spawning periods.								
63 Repair self regulating tide gates at Route 1/Town Line Brook								
64 Revisit MAS/NS water supply report card								
65 Study West Pond, reservoir in Magnolia, for volume of water and means to reduce dam failure.								
66 Watershed wide assessment of DEP's Survey of Public Water Supply								
Land Use								
67 Composting sites								
68 Fund comprehensive assessment of land use at subwatershed scale								
69 Open space - Essex County Buy Local program								
70 Open space - High Rock Park								
71 Open space - Loeb Estate								
72 Open space - Nahant CPA								
73 Rezoning for OSRD								
Invasive Species								
74 Conduct removal of water chestnuts - Reedy Meadow, Pillings Pond								
75 Evaluate and remove phragmites - Saugus River watershed.								
76 Evaluate purple loosestrife eradication								
77 Invasive species - Salem Sound								
78 Invasive species survey - coastal/marine								
79 Invasive species survey – inland								
80 Phragmites proliferation in Smallpox Brook								

Goals ?
vs.
Issues ?



Ecology

81 Anadromous Fish restoration in Saugus River, North River, Crane River (rainbow smelt)
82 Bike trail development
83 Coyote survey at Town Line Brook
84 DEP Wetland program applications
85 Designate Reedy Meadow as ACEC
86 Develop TMDLs for NCW targeted subwatersheds.
87 Enhance spawning habitat for anadromous fish in Saugus River.
88 Evaluate feasibility of fish ladder installation along Saugus River at LWSC Dam.
89 Evaluate potential fish spawning habitat in Saugus watershed, upstream of LWSC Dam.
90 Ground truth Sites-of-Concern data base
91 Habitat restoration project assessment teams
92 Host focus groups on open space
93 Identify large parcels for conservation
94 Implement marsh restoration projects included in the Rumney Marshes ACEC Salt Marsh Restoration Plan.
95 Land acquisition plan
96 List 21E Soils and contaminated sediments.
97 Permanent protection of ACEC habitat
98 Quantify economic benefits of open space
99 Watershed-wide open space plan

Goals ?
vs.
Issues ?

Outreach

100 Attend MCM/NS monthly workshops for Boards of Health and Conservation Commissions.

101 Attend monthly meetings of regional planning organizations where possible.

102 Conduct outreach to schools, local communities, businesses and residents to prevent illegal dumping in the Saugus watershed.

103 Contact major industries within watershed

104 Dialogue with local Chambers of Commerce - include conservation groups

105 Distribute NCW video to libraries and schools

106 Earth Day activities

107 High School outreach programs

108 Include existing groups in Watershed Team

109 Info on grant opportunities

110 Liaison from HealthLink

111 Liaison with Ipswich River reps re: Lake Wenham & drinking water

112 Provide logistical / technical support for local activities.

113 Publicize EPA bacterial survey of Smallpox Brook

114 Publicize grant funding opportunities from CZM, EPA, EOEA, DEP, and others

115 Regional training sessions for local ZBAs & Planning Boards

116 Support circuit rider positions for local boards of health, conservation commissions

117 Visioning conferences: Saugus River, Salem Sound, agricultural land, other topics

4. RECOMMENDATIONS

Based on the evaluations of the 117 issues in Section 3, the following are the recommended priority issues and/or tasks for the NCW Watershed. Most issues and tasks are combined into grouped recommendations, with item numbers referring to the public input list from Section 3, along with which goals from Section 2 each recommendation most addresses. These recommendations are intended as guidelines for seeking funding for community groups. They are in rough order of priority but related recommendations are juxtaposed for coherence.

4A. Study and rehabilitate closed coastal shellfish beds

The NCW's shellfish beds along most of the NCW coast have been closed for many years, but clamming on the beaches was once an integral part of those communities. Shellfish bed health can serve as a proxy for general marine health, and would be a very visible indicator of improvement. The loss of eelgrass is a related issue. Some NCW shellfish beds remain open, in Gloucester and Essex for example, while those which are in closer proximity to contamination sources and population centers have remained closed.

We recommend a study noting which beaches once had shellfish beds, and what is needed to return them to safe sources of food. Only older residents now remember the traditional shellfish beds, and documenting that tradition would serve as public outreach as well as an impetus for cleanup. Shellfish could generate millions of dollars and has one of the strongest economic multipliers of any business, and hence closed shellfish beds is as much about job generation as about ecology. The study might include an economic component of the recreational and financial value of shellfishing in the past and the potential value of reopening shellfish beds. We also recommend working with DMF to prioritize the shellfish beds by their potential economic importance and the amount of effort required to reopen them. A related survey might include which beaches are closed to swimming, for what percentage of each summer.

Prioritization could be based on quality of the resource -- i.e. marketable quantities of shellfish, likelihood of success, etc. In some cases it may be possible to re-open shellfish beds just for restricted digging such as harvesting of bait. (Public Input Items 34, 39 through, 41; Goals 1, 2, and 5).

4B. Initiate and develop salt marsh recreational and ecological survey

Salt marshes in Salem Sound have been reduced from 185 acres to 65 acres since 1960. Rumney Marsh to the south and the Great Marsh to the north face similar problems.

Rumney Marsh is an under-utilized recreational resource, especially for canoeing, kayaking, birdwatching, and perhaps other activities. Rumney Marsh is also the site of a potentially very large project, the Blue Line extension. A recreational survey, perhaps with a species catalog of flora and fauna, would publicize the issues of what are the potential problems of a major construction project in a fragile ecosystem (which is also an ACEC). The previous plan for Rumney Marsh included a species list along with a list of projects dedicated to restoring flow and habitat, and a follow-up could be done with recreational focus. Similar efforts should be done for the Great Marsh and for smaller marshes in NCW, with a focus on restoration, mitigation and enhancement.

The same could apply to the potential expansion of Route 1 at nearby Town Line Brook. A more general study might encompass transportation growth needs in general, in relation to protected wetland areas. The potential expansion of Route 1 in this region is an opportunity to correct some of the long time drainage and flooding problems associated with Town Line and Linden Brook, including upgrading the Town Line flood gates to make them safer to operate. (Public Input Items 23, 31, 32, 63; Goals 2 and 1).

4C. Reinstitute beach maintenance & develop area beach management plans

The NCW includes some of Massachusetts' finest beaches, but the beaches in the more densely populated areas are not as well maintained as the popular beaches on Cape Anne. With the advent of the Blue Line extension to Lynn, the beaches near there will likely become as popular as Revere Beach, which already has a Blue Line station. Revere Beach itself, despite its history as America's first public beach and its current heavy usage, is not treated as a community-wide resource. Older residents throughout the watershed recall when public high school

students cleaned the beaches as a weekly routine. Reinstituting that sort of practice would generate public awareness and would increase membership for the sponsoring organization, as well as promote cleaner beaches at less public expense. Regular beach cleanups might also identify sources of water pollution and other beach contaminants. Several local watershed groups already run river cleanups. A regular beach cleanup would be well within their scope. Management plans might include community-based beach cleanup but might also include less maintenance, such as not removing bird-feeding materials (Public Input Items 35, 37, 47; Goals 5 and 3).

4D. Expand river and lake cleanups

Existing programs of regular river cleanups should be extended to other rivers in NCW and to some of the larger lakes as well. The lakes in particular are not viewed as recreational resources, and an event that focused on their cleanliness would serve to change public awareness (most polluted lakes are open to swimming and boating at least part of the year) as well as increase awareness of what needs to be done to foster more healthy lakes and rivers.

Specific issues include fly ash in Wenham Lake; algae buildup in Lake Quannapowitt; water quality issues in Chebacco Lake; and the general annual cleanup of the Saugus River by SRWC and smaller river cleanups by SSCW. While the fly ash and algae cannot be removed by volunteer labor on a weekend, they can perform regular cleanup and be made aware of the more difficult environmental issues. River and lake cleanups serve at several levels: they can generate publicity; they improve both the quality and the aesthetics of the resource; and most important the power citizen involvement. Regular cleanups might lead to additional studies on addressing pollution sources, analyzing the surrounding area's hydrology, etc. (Public Input Items 7 through 12; Goals 3, 5, and 6)

4E. Publicize and reduce contaminated stormwater runoff

Non-point source pollution is a major source of problems in NCW lakes, rivers, and ultimately beaches. The major sources are:

- ? fertilizers and herbicides from lawns;
- ? pet waste (as well as animal waste from semi-tame Canadian geese);
- ? leaching from contaminated soils and groundwater, from historical industrial activity;
- ? nutrients from on-site septic systems; and
- ? runoff of sediment, road salt, petroleum products, and heavy metals from impervious surfaces.

The target of this recommendation is the general public and local officials. The general public is generally unaware of the connection between their activities and water pollution. Local officials are often unaware of inexpensive practices that would greatly reduce contaminated runoff. Some specific sub-recommendations:

- ? Citizens are generally unaware of the connection of their lawn maintenance (fertilizers and herbicides) on water quality in nearby lakes, so the primary issue is publicity about them. A brochure on lawn fertilizers can be found at http://www.mass.gov/dep/brp/wm/files/fertiliz.pdf
- ? Citizens are generally unaware of the connection between pet waste and water quality as well. A brochure on this subject can be found at http://www.mass.gov/dep/brp/wm/files/petwaste.pdf
- ? Establishing buffer zones along lakes with nearby lawns (such as Lake Quannapowitt) would be effective, especially where no buffer zones exist at all.
- ? Educate communities to consider permit and development strategies that address stormwater runoff – implementing BMPs that reduce runoff, beneficial stormwater recharge, buffer zones, and Low Impact Development (LID) in general.
- ? Problems caused by roads and impervious surfaces in general will increase in the future, and a base study estimating current runoff quantities of each pollutant would be valuable for future comparison.

MassGIS has been planning an "impervious surface layer" for some time – its completion would provide data about the issue in NCW relative to the rest of the state. (Public Input Items 13 through 22; Goals 3 and 6)

4F. Restore and Protect Water Quality/ Reduce Pathogens

This general recommendation applies to the NCW's rivers, streams, lakes, and ponds, as well as coastal marine waters. Eliminating point sources of pollution (primarily CSOs) and reducing non-point sources (detailed in 4E) make for a starting point.

Some of the recommendations of DEP's 1997/1998 Water Quality Assessment of the North Coastal Watersheds remain unimplemented. We recommend continuing and expanding stormwater monitoring through regular bacterial sampling of streams and outfalls in the Salem Sound watershed and elsewhere in the NCW. Some specific sub-recommendations:

- Innovative use of the State Revolving Fund for septic improvement.
- Better use (via publicity, perhaps) of the income tax credit for septic improvement. Current tax credit is $6,000 for correcting failed septic systems.
- Fix illicit sewer connections to reduce pathogens and monitor existing and fixed systems.
- Rehabilitate old sewer systems (for example, Salem's was built in 1906!)
- Communities need guidance in evaluating upgrades of sewer systems (septic vs. town systems). A useful manual is at http://www.epa.gov/region1/topics/assets/pdfs/OWTSFactSheetFINAL.pdf .
- Better use of "Watershed Aquifer Protection" for legal protection upstream-to-downstream.
- Aquifer protection extends to drinking water protection, management, and planning. A buildout analysis appears in Appendix M to assist with analysis, for determining where additional protection is appropriate.
- Address / publicize pet cleanup as a water quality issue
- Reduce public geese feeding, especially along lakes (such as Lake Quannapowitt) where geese and people both congregate. Goose waste is a major source of bacterial runoff.

This general recommendation is related to the more specific recommendation above regarding contaminated runoff. Details about the numerous issues involved with both these recommendations are provided in Appendix C, in three related topics areas: C12, contaminated stormwater issues; C13, impervious surface runoff; and C14, wastewater issues. (Public Input Items 28, 42 through 52, and 13 through 19; Goals 1 and 3).

4G. Protect, evaluate, and restore sensitive habitat

The ecological integrity of the NCW is at risk because of numerous sensitive habitats throughout the watershed which are under development pressure from population growth. At-risk habitat should be protected where intact, evaluated where lost, and restored once evaluated. This general recommendation covers numerous subtopics:

- Wingaersheek Beach contains the only sand dunes off Cape Cod (other than the demise of dunes along Revere Beach the geology of the intervening areas probably does not support barrier beaches or dune formation)
- Heath lands and grasslands in Lynn Woods and Cape Anne
- Eelgrass habitat in shallow marine areas of Nahant, Beverly, and Manchester provide marine juvenile nursery habitat
- Vernal pools are a unique habitat which are under-catalogued in NCW
- Direct habitat loss affects salt marshes and other wetlands
- Marine and terrestrial invasive species are a major issue especially in Salem Sound
- Marine invasives primarily from ballast water and shipping and food production

Invasive species are a major threat in the NCW to sensitive habitat. While invasive species are recognized by ecologists the issue is mostly unknown to the general public. This researcher saw numerous examples of general acceptance of invasive species as normal – from bouquets of phragmites to calendar photos featuring purple loosestrife. Groups should consider including them as part of other grant proposals instead of as the main focus. Including invasive species as part of a general category of "sensitive habitat" would be a more effective means of educating the public on this issue. (Public Input Items 74 through 80; Goal 2).

4H. Maintain natural water flow regime

Low river flow is the source of many problems in NCW. Maintaining an adequate – and preferably natural – water flow would improve aquatic ecosystem viability, would help with base flow flood control, would ensure viability of the drinking water supply, would help ensure public safety via fire control water pressure, and would improve aesthetics and recreation. An improved flow would also aid with anadromous fish restoration as detailed in the next recommendation. Some specifics for water flow:

- ? Reduce or eliminate flow manipulation wherever possible.
- ? Consider dam removal where feasible.
- ? Reduce intra-basin transfers including wastewater.
- ? Beneficial infiltration to maintain base flow.
- ? Alleviate tidal restrictions.
- ? Promote Low Impact Development (LID).

(Public Input Items 4, 53, 56 through 60, 62 through 65; Goals 4 and 2).

4I. Restore anadromous fish habitat

Anadromous fish restoration is needed in several rivers in the watershed, especially the Saugus River, where the focus is on river herring (alewife). In general, low flow is the problem, and maintaining adequate flow would help fish runs. All data points to major loss of viability of anadromous fish populations, and that the number of spawning adults is down.

In the absence of adequate flow, and in the presence of dams, fish ladders would assist anadromous fish runs. Studies of this issue would include: fish ladder feasibility studies, fish counts, study of spawning habitat. The goal would be to restore the last century's fish runs of thousands, all the way up to Lake Quannapowitt, but the water has to be there for any projects to work. (Public Input Items 4, 9-11, 62-65, 81, 87-89, 91; Goals 2 and 4).

4J. Watershed-wide flood planning

Flood protection and flood planning was independently cited as an issue in several different communities around NCW. Besides focusing on individual solutions to each flooding issue, we recommend a watershed-wide focus on information sharing and lessons-learned from flood control, both from elsewhere in the NCW and from other watersheds. The Watershed Team (or a specialist in flood control who traveled to the several towns listed) could serve as an information source on BMPs and on establishing the need and benefit for flood control.

A related sub-recommendation is: Improve the watershed's physical characteristics and functions by specific flood prevention. Physical watershed functions should be addressed in an ecologically sensitive way, avoiding drastic and permanent solutions like the multi-mile wall proposed by the ACE, known as "The Great Wall of Saugus."

In general, hydrological studies are partially complete but their recommendations remain unimplemented. The ecological benefits of flood control also should be more integrated into other flood planning. Flood control measures should account for anadromous fish migrations. (Public Input Items 53 through 63; Goal 4).

4K. Watershed-wide open space planning

Several local groups focus on "greenbelts" and parks in one area. There is an additional need for information sharing between those groups, which could be served through the Watershed Team. The NCW Team, or a traveling specialist, could host focus groups on open space issues. These focus groups would include examples of successful open space conservation from other nearby towns, bylaw and zoning changes for implementing "Conservation Subdivisions," information about conservation easements, etc.

The focus groups should start with Conservation Commissioners and Zoning Board members, but should also include Planning Board members, city staff responsible for open space planning, representatives from permit-granting authorities, as well as elected officials and their staff. The purpose should be education on the conservation and ecological goals of open space planning as well as input from focus group participants on their goals.
(Public Input Items 67 through 73, 92, 98, 99; Goals 2, 1, and 6).

4L. Preserve and protect farmland

Farmland represents large parts of the open space remaining in the NCW. Farms also provide habitat, but are currently being reduced by seven to 15 acres per day[9] statewide. Fostering "buy local food" initiatives provides a financial boost for local farms. This recommendation includes an education and outreach aspect. (Items 27, 68, 69). Some specific sub-recommendations:

- Foster "Agricultural Commissions" on a regional basis if possible, or on a town basis. Purpose would be to inform the public, elected officials, and their staff about agricultural issues, analogous to Conservation Commissions.
- Provide information on direct financial benefit of farms (local food, local jobs) as well as the indirect benefits such as wildlife habitat, historical resources, and open space.
- Make tie-in to other environmental issues, especially CO2 reduction, by reducing food transportation due to local purchasing. Farmland also provides CO2 sequestration.

(Public Input Items 27, 69 98, 117; Goals 1 and 2).

4M. Implement the Grow Smart North Shore Open Space Plan

The Watershed Team endorses the Grow Smart North Shore Open Space Plan as its open space guidance. The recommendations there should be considered recommendations of this action plan as well. The Open Space plan is available on our website, www.northcoastal.net/ncw/Docs/GrowSmartNorthShore.pdf .

Some of the Grow Smart recommendations are outdated, so some specific recommendations focus supporting sustainable growth and planning and implementation for that support:

- Support the Green Neighborhood Alliance.
- Plan for adequate water supply to meet growth in demand.
- Conduct a watershed wide assessment of DEP's Comprehensive Survey of Public Water Supply.
- Redevelop abandoned and under utilized properties.
- Support local Open Space Committees and an Open Space Committee network.

(Public Input Items 54, 61, 67 through 73, 92, 95, 99; Goals 6 and 1).

4N. Direct outreach to communities / build sense of stewardship

Environmental groups and watershed teams tend to "preach to the choir," and hence there is a need for public outreach. Outdoor public Earth Day activities, and focusing on high school students, are good solutions to this problem. The to-be-produced NCW video would serve well as an introductory tool for both those audiences as well as others. (Public Input Items 104 through 107). Including greenbelt organizations, chambers of commerce, and major industries would widen the watershed dialog to other stakeholders.

There are numerous effective watershed groups, conservation groups, and open-space groups throughout the watershed but they often do not work together towards mutual goals. This reflects in part the diverse geography of the watershed and also reflects in part the lack of MWI impetus. Several of the recommendations focus on watershed-wide actions – in general, including chambers of commerce, major industries, boards of health, Conservation Commissions, as well as local environmental groups would gain. (Public Input Items 100 through 117).

The NCW region has little cohesive identity, since it lacks the unifying river that most watersheds have. Hence liaison activity with other North Shore watersheds – specifically the Ipswich River Watershed, the Merrimack River Watershed, and the Parker River Watershed – should be considered the larger-scale version of this recommendation. (Public Input Items 100 through 117; Goal 6).

[9] Mass Audubon estimates seven to fifteen acres lost per day, based on the 1997-2002 census, in its publication "Losing Ground". The 2002 Census of Agriculture estimates up to 32 acres per day loss, based on somewhat different criteria.

4O. Liaison for grant opportunities

The NCW Team should establish itself as a prime information source for grant funding news. This can be accomplished via the website and/or an e-newsletter. In the post-MWI situation, this is an important need for local groups. The local groups should send representatives to the NCW Team meetings for the purpose of liaison with other groups and to be more aware of grant opportunities. In particular, we recommend regularly inviting new participants to NCW Team meetings and making it worthwhile for them to attend by distributing grant-writing materials from fresh grant sources. Also, several Ipswich River-based groups (e.g., Wenham Lake groups) might be included as well, because the high cross-basin transfer between NCW and Ipswich. (Items 108 through 111, 114). A list of federal and state grant opportunities appears in Appendix G. (Public Input Items 101,108, 109, 114; Goal 6).

4P. Meet watershed goals via other projects

In previous watershed action plans, the specific recommendations were directed toward the Watershed Team, to be implemented and funded over the subsequent five years. With the dissolution of the MWI, that goal can be met in concept by encouraging the implementation of the watershed initiative's goals via other funding sources, in conjunction with other projects, and by citing the general goals of this report as evidence of ecological needs.

The Grow Smart North Shore Open Space Plan should be considered a good example of the watershed team's goals being well represented via other projects. Other regional and local planning documents should be encouraged to do the same. In particular, two regional documents are forthcoming which would benefit from NCW and other watershed team input: the MAPC (Metropolitan Area Planning Council) plan and the MVPC (Merrimack Valley Planning Commission) Plan. Both should include the interests of NCW, since they are seeking bottom-up input and representation on their Steering Committee. Most immediately, the MAPC "Metro Futures" steering committee meets in summer 2004.

The same concept applies to planning documents on a smaller scale than the watershed level. Community planning, as well as sub-watershed planning, should include NCW concerns goals. In particular, 401 Certifications are a good venue for including watershed concerns. In general, NCW team members should use this report as a means to include those concerns and goals in community planning documents. (Public Input Items 5, 66, 73, 100, 104, 110, 115; Goals 6 and 1).

A VISION FOR THE WATERSHED

There will be a continuing need for additional data collection in the watershed, to enhance our ability to conduct a more comprehensive assessment of watershed conditions. Other general ongoing tasks include:

- An assessment of the composition and overall functioning of the Watershed Team, and implementation of appropriate changes to increase stakeholder representation, participation of team members in watershed activities, and the overall efficiency and effectiveness of the Team;
- Identification of additional watershed stakeholders and recruiting new Team members;
- An accounting of the measurable successes of the Team to date;
- Identification and prioritization of watershed issues and concerns as this report becomes outdated;
- Assuring active Team participation in the development of important documents, such as the new 303(d) list;
- Working more with watershed partners in securing grants;
- Development of a periodic watershed e-mail newsletter;
- Further development of the watershed website, both as a means of information dissemination, and for soliciting stakeholder input on watershed and Team activities and issues.

We will also employ a multi-pronged approach that adjusts to the availability of resources, provide an effective means of adjusting to opportunities in funding, new initiatives, community interest and sufficient flexibility to adjust to the vagaries of time and resources. Recognize that meaningful change will not necessarily be exhibited in the short term speaking either in a spatial or temporal sense. Our key strategies are to implement efforts at the subwatershed level. Wherever possible we recommend utilizing pilot projects to test certain assumptions and practices and evaluate their effectiveness in different locations. Understand that in many cases a variety of resources maybe needed to accomplish long term goals and where possible the need to combine the attributes of programs, resources and communities to augment the process. Our focus will be to:

- ***Integrate*** activities, responses and assistance to local communities and citizens with team members where ever and as often as possible,
- ***Work in increments*** many of the issues will not be solved by the success of single action but require several actions,
- ***Project*** local successes through collaborative demonstrations to other communities.

Appendix A: Organizational Background

A1. The Massachusetts Watershed Initiative

The Massachusetts Watershed Initiative is a broad partnership of state and federal agencies, conservation organizations, businesses, municipal officials and individuals. Begun in 1996 by the Executive Office of Environmental Affairs (EOEA). The Watershed Initiative is an innovative, result-oriented program. Multi-discipline watershed teams are charged with providing comprehensive watershed protection in each of the 27 major watersheds in the Commonwealth. 20 full-time team leaders who report directly to the Secretary of Environmental Affairs manage the 27 interdisciplinary watershed teams. Watershed Teams form the foundation of the state's watershed protection efforts by providing direct watershed-specific linkage between agencies and the community. They effectively serve as the "eyes and ears" of the Environmental Secretariat. The watershed teams also assist watersheds in overall planning and implementation through the development of a five-year watershed action plans and annual work plans. The Five Year Watershed Action Plan serves as the strategic planning document for the Watershed Team, while the Annual Work Plans developed by the team detail the significant environmental issues within the watershed, a summary of the previous years activities and a list of prioritized projects.

The priority project list represents the Watershed Team's consensus judgment on projects that should receive prioritized funding. Such funding previously was supplied directly through the various funding mechanisms available to the Executive Office of Environmental Affairs. Watershed teams would submit annual work plans to a "Roundtable" comprised of senior level managers under EOEA and Community partners. The Roundtable was the mechanism by which to ensure that agencies are allocating their resources – both people and money – according to the priority issues and actions identified by the teams. The Roundtable serves as a clearinghouse and priority setting group for the Watershed Initiative to review annual work plans, ensure consistency of service, and reconcile competing demands for allocation of resources while supporting the needs of each watershed. Resource needs of the teams are communicated and addressed directly by top management, by-passing the many layers of bureaucracy that stand between our front line staff and communities and the ultimate decision makers. The goal is to facilitate locally based problem identification and problem solving and coordinate implementation activities among all parties along seven program elements (these seven program elements correspond to the six goals of this Action Plan, with outreach and education combined into one goal):

- Outreach and Education.
- Local Capacity Building
- Water Quality
- Water Quantity
- Habitat
- Open Space
- Recreation

One of the central tenets of the MWI is that the most effective environmental decisions occur when scientifically sound solutions are vetted through a process of public involvement that supports appropriate regulatory actions. The Watershed Initiative employs an iterative 5-year program with a targeted activity for each year of the program.

- Year 1 – Outreach
- Year 2 – Research
- Year 3 – Assessment
- Year 4 – Planning/Implementation
- Year 5 – Evaluation

It was further determined that in order to successfully implement the Watershed Initiative Approach it would take time to both harness and distribute available resources. Accordingly, the full 27 watersheds would be progressively phased in to complete a full 5year planning cycle there bye avoiding the over taxing of critical resources.

A key objective of the MWI is the integration of community interests and regulatory programs for the protection of our environment. A "*watershed*" defines the geographic landform where the surface and ground water

flow downhill to a common point, such as a river, stream, pond, lake, wetland or estuary. We have chosen to define *"communities"* as the set of entities whose collective interests have a common goal of a healthy environment. Ecological researchers have also employed the terms *"Natural Community"* and "ecoregions" to describe the interacting assemblage of plant and animal species that occur together and which share a common environment. The concept of ecoregions was employed in the development of the Massachusetts Ecological Regions Project: *Griffith, Glenn E. et al., for U.S. Environmental Protection Agency and Massachusetts Department of Environmental Protection, Corvallis, 1994.* The success we have in bringing these *"communities"* together to protect and enhance our *"natural communities"* will in large part determine the success of the North Coastal Watersheds Action Plan.

The voluntary, grassroots work done by *local community* partners is critical to the success of the Watershed Action Plan. However, it is not sufficient unto itself to deal with all of the issues. While certainly not unique to NCW, the combination of water quality problems, degree of urbanization, extensive industrial history and stressed natural resources have resulted in a high degree of environmental regulatory activity. It is beyond the intent of this plan to provide a complete history of federal and state legislation, the regulations or the agencies dedicated to environmental protection. Appendix L highlights some of the critical legislative authorities, programs and regulations administered by federal state and local authorities that will be used in support of the *North Coastal Watersheds Action Pl*an. We will also highlight where appropriate key phrases and language found in the legislative authorities, programs and regulations that we have into our Action Plan. Appendix P contains many acronym definitions, including programs that have changed name under the new Administration. For more detailed information regarding environmental regulations within the Commonwealth of Massachusetts please consult the web page http://www.mass.gov/portal/index.jsp and related links.

A2. Watershed Teams and Community Action

Each of the *communities* within the watershed has its own unique mission and resources. Acting individually, they frequently do not possess all of the skills and resources necessary to solve the wide range of complex problems facing the watershed.

Examples include: The problem of contaminated stormwater emanating from street drainage systems along highways and local roads requires the coordinated involvement of municipal, state and federal authorities to achieve meaningful reductions in pollution loading. Managing sustainable growth must involve local and state officials, planning boards, regional planners, citizens, and developers.

The resources of any one of the communities cannot solve these complex problems. Complex multifaceted problems often require the bringing together of resources of disparate *communities* to craft effective solutions. The Action Plan will adopt the strategy that draws upon the unique set of resources and expertise of each *community* to articulate a set of shared goals and objectives, culminating in the development of solutions that enjoy the benefits of all available resources. The Plan will foster true partnerships between municipal officials, non-profit organizations, citizens, businesses and government agencies, achieving the best possible protect to, and restoration of our threatened resources of land and water.

A3. Watershed Team Structure and Process

In order to effectively deal with these often complex and conflicting problems, the North Coastal Watersheds Team will follow the structure and process developed by the **Massachusetts Watershed Initiative**. The key features of the Mass Watershed Initiative are:

- The co-leadership roles of the state, watershed associations or other citizen groups, the business community, and municipalities in implementing the watershed approach;
- 27 interdisciplinary watershed teams managed in the past by 20 full-time team leaders, and currently by committed individuals who work full-time in other state positions;
- Watershed-based outreach, resource assessment, planning and implementation involving all stakeholders;
- Annual watershed workplans as the vehicle for integrating specific activities in each watershed.
- Subwatershed problem identification and action plan development;

? Target limited dollars to watershed priorities, so they are used where we can achieve the most environmental protection;

? Support local action and empowering local people to protect their local resources.

The Initiative evolved after it became apparent that no single entity (*community*) had all of the resources necessary to manage or resolve all of the environmental issues within the Commonwealth. In order to adequately protect the natural resources and quality of life of the Commonwealth these sometime disparate *communities* would have to come together. A unique attribute of the Watershed Initiative is the realization that often, it should be the local municipalities and the citizenship's decision as to what should be the priorities and resources that need the most protection. At the very least they should be active participants in the process. Each of these issues therefore may take on varying degrees of importance at the subregional and subwatershed levels within the North Coastal Watersheds as determined by the specific needs, availability of resources and efforts of the community partners. The design of the Watershed Initiative provides mechanisms for integrating the strengths of each community into demonstrable success. As of 2003, the Massachusetts Watershed Initiative no longer funds full-time team leaders. However, the Massachusetts Executive Office of Environmental Affairs, the original sponsoring agency, still adhere to the goals and methods of the MWI.

A4. North Coastal Watersheds Team History

The North Coastal Watersheds Team came into existence in calendar year 1997. Initially the team consisted of personnel from the various state and federal regulatory programs. Larry Gil, the first North Coastal Team Leader, sought to expand membership by reaching out to a list of the region's local contacts. He first visited with local community groups at their respective locations, inviting all to attend the first North Coastal Watersheds Team Meeting in March 1997. The list of attendees is significant since it verifies the breadth of the communities within communities, the commonality of some problems and the diversity of interests. See list of community groups in **Appendix B**. At the close of the meeting the group reached the following conclusions:

? Local governance committees, non-profit organizations, effectively service the North Coastal Watersheds. "Grassroots" organizations are localized, often well established, have varied interests and are well tuned to the communities and citizenry that they serve.

? Federal, state, and local authorities do not often pool their resources and the authorities provided by their regulations to address environmental problems.

? Communication and coordination of authorities across and between regulators needs to be improved. Effective communications involves maintaining frequent contacts, establishing dialogue and engagement in solving problems.

? The attendees agreed to serve on a watershed team.

After much discussion, four critical points emerged to guided the team's efforts over the next several years:

? More interagency coordination / communication and involving locals in state environmental work.

? Increased teamwork on current subregional and local efforts rather than rebuilding the wheel.

? Coordinate DEP's regulatory requirements and sampling with the basin schedule.

? Greater conservation of critical resources by working with interconnected ecological regions rather than a patchwork of cities and towns.

The team determined that the most productive use of our limited resources was to work collaboratively on specific new projects while continuing to support ongoing projects. The North Coastal Watersheds is blessed with an active citizenry. Each *community* representative comes to the meeting with the understanding that the integrity of their individual missions as proactive stakeholders will be honored thereby fostering an environment of mutual trust between the communities. Each plays a pivotal role in organizing and promoting citizen involvement within their respective spheres of influence. The linkage between the respective *communities* serving in the North Coastal Watersheds has been through the development of annual workplans and the implementation of priority projects. Priority projects represent the team's consensus judgment as to where limited resources should be best directed to

address the MWI program elements. The North Coastal Watersheds team has employed the following selection sequence to identify its priority projects.

- Team members are requested to submit draft descriptions of priority needs not being addressed to the team leader, or via the website http://www.northcoastal.net/ncw/forum_main.asp
- The team leader compiles and then distributes the draft project descriptions to all team members;
- The projects are further refined and crafted into scopes of work;
- A finalized list of all the priority projects is presented to the team membership;
- The membership ranks all of the projects based on the quality of the content, perceived need, consistency with targeted work plan activities.
- Based on the cumulative team votes the selected priority projects are submitted with the annual work plan to the Roundtable. (This will likely not exist while unless the MWI is re-instituted).

The result of this approach has been a successful multi-year collaborative effort based upon the various stakeholders coming together to address issues relevant to the North Coastal Watersheds. The team has a core constituency that includes representatives and/or major stewards from:

- Department of Conservation and Recreation (DCR, formerly DEM and MDC)
- The Department of Environmental Protection's Northeast Regional Office
- Department of Fish and Game (DFG, formerly DFWELE).
- Eight Towns and the Bay (8T&B)
- Essex County Greenbelt Association
- Friends of Lake Quannapowitt (FOLQ)
- Friends of Lynn Woods (FOLW)
- Lynn Water and Sewer Commission (LWSC)
- The Metropolitan Area Planning Council (MAPC)
- Mass Audubon Society North Shore (MAS/NS)
- Massachusetts Department of Agricultural Resources
- Massachusetts Office of Coastal Zone Management North Shore Office (MCZM/NS)
- Safer Waters in Massachusetts (SWIM)
- Salem Sound Coastwatch
- The Saugus River Watershed Council (SRWC)

Membership on the NCW Team continues to broaden with the inclusion of community and business partners, however their participation is generally focused on specific issues. Please consult the team membership page for a current list of team participants including state and federal agency membership. The NCW Team meets on a regular basis (monthly for much of the year).

A5. Seven Years in Review

For the first four years the team had an annual program budget of roughly $100,000, all of which was used to fund as many as eight projects each year. Projects that crossed watershed boundaries were undertaken in partnership with neighboring watershed teams providing maximum leverage of limited resources. The North Coastal Watersheds began 1997 as Year 2 in the five-year cycle - Information gathering. Much of that first year was focused on the collection of water quality monitoring data. Near the end of 1997 and extending into 1998, the team progressed to the Year 3 focus of Assessment.

Throughout the first years, the team worked to:

- ***Integrate*** activities, responses and assistance to local communities and citizens with team members where ever and as often as possible.
- ***Work in increments*** many of the issues will not be solved by the success of single action but require several actions.

? ***Project*** local successes through collaborative demonstrations to other communities as examples of the Massachusetts Watershed Initiative Approach to address problems.

The first four years of the North Coastal Team provided a solid foundation from which to develop an effective 5-Year Action Plan for the North Coastal Watersheds. The writing of the 5-Year action plan began in 2001. A first draft was completed in 2002. EOEA contracted with Perot Systems Government Services in 2003 to seek public input and finalize the draft – the final version is scheduled for release in mid-2004.

The following sections contain summaries of the issues addressed and strategies employed for each of the seven MWI program elements with highlights of North Coastal Watersheds accomplishments, significant events, and significant partners. **NCW Team members** are highlighted in **bold** as are **priority projects**.

Appendix B: NCW Team Members

Active or historic members of the North Coastal Watersheds Team 2002-2004. Active members are **bolded**.

Last Name	First Name	Organization
Barber	Judy	DEP Municipal Assistance Program
Blair	James	DEP/DWM Monitoring Coordinator
Blanchard	**William**	EOEA & MDAR (DFA)
Cademortori	Emilie	8 Towns and the Bay
Cassotis	Rebecca	Project Assistant, North Coastal Watersheds Team EOEA
Chase	Bradford	DFWELE (DFG) Division of Marine Fisheries
Cleaves	Sam	Regional Planner, Metropolitan Area Planning Commission
Comeau	**James**	DCR (MDC) Right of Way Agent
Cooper	Andrea	MA CZM North Shore
Davis	Rebecca	Wakefield Conservation Agent
Dawe	Richard	Lynn Water and Sewer Commission
Della Pena	Craig	Rails to Trails
Delpapa	**Cindy**	DFG Riverways Program
Dunn	Cynthia	Salem Sound Coastwatch
Ferris	David	MA Division of Water Pollution Control
Fortier	Scott	EOEA Office of Technical Assistance
Galazka	Marzie	Planner, City of Everett
Gil	Lawrence	Former North Coastal Watersheds Team Leader (EOEA)
Glenn	Kathryn	CZM North Shore Regional Office and SRWC
Gough	**Rob**	Salem Sound Coastwatch
Hall	Andrew	Lynn Water and Sewer Commission
Harris	Annie	Essex County Heritage District
Heath	**Doug**	Friends of Lake Quannapowitt
Hill	Michael	EPA, Region I NCW liaison
Hopkins Young	Karen	Salem Sound Coastwatch
Hutchins	Eric	National Marine Fisheries Service
Inglefinger	Franz	TTOR regional ecologist

Johnson	David	Chief Environmental Officer, GE Aircraft Engines, Lynn
Johnston	Patrick	Everett Police Marine Unit
LeBlanc	**Joan**	Program Director, SRWC
Marler	Linda	Geologist, DCR (DEM)
Marx	Lise	MWRA
McQueen	**Mark**	National Resource Conservation Service, USDA
Mieta	Bob	Lakes and Ponds program
Millhouse	Christine	Environmental Engineer, City of Gloucester
O'Connell	Nathanial	MET
Pahlavan	**Dominique**	Mass GIS and EOEA
Phippen	**Peter**	8 Towns and the Bay
Port	Andy	Dept. of Community Dev. and Planning City of Peabody
Purinton	**Tim**	Massachusetts Audubon Society North Shore Chapter
Rasmussen	**Christine**	Ward 5 Councilor, City of Gloucester, and Essex County "Buy Local" project manager
Richards	Todd	DFWELE fish counts
Smith	Timothy	Circuit Rider, Wetlands Banking and Restoration Program
Sorenson	Elizabeth	DCR (DEM) ACEC Program Coordinator
Straub	James	DCR (DEM) Lakes and Ponds Program
Stringi	Frank	Planner, City of Revere
Warren	**Barbara**	Salem Sound Coastwatch
Watson	Gregory	Planner, City of Malden
Wollenhaupt	Rosalia	DEP/NERO, North Shore Grant Coordinator
Wrynn	Kathy	President, Saugus River Watershed Council

Community Groups

The following list of community groups were contacted during the course of writing this Action Plan. Website references are included where available. Groups that are not included on the Watershed Team Member list above should be considered potential Team Members for the future.

Community Group	Web site
Chebacco Lake Association	David Lash, president; David Kerr, former president
Coastal Zone Management – North Shore Regional Office	http://www.state.ma.us/czm/NS.HTM
Eight Towns and the Bay	http://www.8tb.org/
Essex County Buy Local Program	http://www.buyfresh.org
Essex County Greenbelt Association	http://www.ecga.org/
Friends of Lake Quannapowitt	http://www.wakefield.org/folq/folq.htm
Friends of Lynn Woods	http://www.flw.org/
HealthLink – North Shore Citizens Environmental Group	http://www.healthlink.org/
Ipswich River Watershed Association	http://www.ipswichriver.org/
Massachusetts Audubon Society	http://www.massaudubon.org/index.php
Nahant SWIM, Inc.	http://www.nahant.org/community/swim.shtml
National Marine Fisheries Service – Northeast Regional Office	http://www.nero.noaa.gov/ro/doc/nero.htm
Salem Sound Coastwatch	http://www.salemsound.org/
Saugus Iron Works – National Park Service Historic Site	http://www.nps.gov/sair/
Saugus River Watershed Council	http://www.saugusriver.org/
The Trustees of Reservations – Northeast Massachusetts Region	http://www.thetrustees.org
Wenham Lake Watershed Association	http://www.wlwa.org/templates/homepage.cfm

Primary Watershed Team Contact Groups

The Saugus River Watershed Council is a non-profit organization founded in 1991 to protect the natural resources of the watershed. Their priorities include restoring water quality, expanding public access, restoring habitat for anadromous fish and other wildlife, and protecting critical resources such as Rumney Marsh.

The council works with schools in Lynn, Revere, Wakefield and Saugus for watershed field studies. They also organize volunteers for river cleanups, conduct water quality testing programs, organize interpretive walks and educational exhibits, work with other organizations and various other activities to enhance and protect the Saugus River Watershed.

SRWC
PO Box 1092
Saugus, MA 01906

Email: srw@shore.net
Website: www.saugusriver.org
Executive Director: Joan LeBlanc

Salem Sound Coastwatch (formerly Salem Sound 2000) is a 501(c)(3) non-profit coastal watershed association that works in partnership with local governments, businesses and non-profit organizations from the communities of Peabody, Marblehead, Salem, Danvers and Beverly. Established in 1991, Salem Sound Coastwatch is dedicated to taking cooperative action to protect and enhance the environmental quality of Salem Sound. Their top priorities are to protect public health, restore coastal wildlife habitat, and increase recreational and sustainable commercial opportunities. They generate vast amounts of water quality data, work to educate and promote active participation of all stakeholders, and support local governments in a number of ways.

Salem Sound Coastwatch
201 Washington Street
Salem, MA
978-741-7900

info@salemsound.org
www.salemsound.org

Eight Towns and the Bay (8T&B) is a coalition of nine communities located along Ipswich Bay. The coalition includes educators, state and local officials, nonprofit organizations, and interested citizens who are concerned with protecting and restoring the area's coastal environment. 8T&B works with communities and the general public to foster stewardship of coastal resources by heightening public awareness of solutions to pollution problems, providing technical assistance, and supporting local research and education projects. 8T&B is sponsored by the Merrimack Valley Planning Commission and the Massachusetts Bays Program.

Merrimac Valley Planning Commission
160 Main Street
Haverhill, MA 01830

978-374-0519
info@mvpc.org
www.thecompass.org/8TB/

The Nahant Bay/Broad Sound Subgroup, part of the Metro Boston Local Governance Committee, covers the communities of Lynn, Nahant, Revere, Saugus and Swampscott. The members of this group work to implement the Comprehensive Conservation and Management Plan - the guidance document of the Massachusetts Bays Program. The Nahant Bay/Broad Sound Subgroup meets bi-monthly, and works closely with local officials, citizens, nonprofit groups and state agencies. Some of the projects they are currently working on are a water quality assessment of Flax Pond in Lynn and a storm drain stenciling project in Lynn as well.

Metropolitan Area Planning Council
60 Temple Place, 6th Floor
Boston, MA 02111
617-451-2770 ext. 2061

Technical Assistant/Environmental Planner: Sam Cleaves
scleaves@mapc.org
www.state.ma.us/massbays/metroboston.html

The Essex County Conservation District sponsors the Essex County Buy Local Program and other farm-related programs.

Essex Conservation District
P.O. Box 346
Hawthorne, MA

Project manager: Christine Rasmussen
christine@ward5.com

Appendix C: Issues Background

This appendix lists the major issues in the North Coastal watersheds, with some breakdown by subwatershed systems. Included is background information on specific issues that arose during the public input phase of this project. Additional reference material and input from community members is available on the "Comments" section of the website, http://www.northcoastal.net/ncw/forum_main.asp. The website documents the source of the comments in most cases – readers should interpret any data which is undocumented in this report as from the website comments section, where source citations can be found.

NCW subwatershed list

SAUGUS	NAHANT BAY	SALEM SOUND	CAPE ANN	SALISBURY/ AMESBURY
Bennett's Pond Brook	Lynn Harbor	Bass River	Alewife Brook	Blackwater River
Broad Sound	Nahant Bay	Beverly Harbor	Annisquam River	Smallpox Brook
Hawkes Brook	Phillips Beach	Beverly Rocks	Beaches	
Lower Saugus	Stony Brook	Chubb Creek	Cat Brook	
Pines River		Crane River	Chebacco Lake	
Revere Brook		Danvers River	Essex River	
Shute Brook		Forest River	Gloucester Harbor	
Town Line Brook		Frost Fish Brook	Good Harbor Beach	
Upper Saugus		Goldthwaite Brook	Halibut Point	
Lake Quannapowitt		Marblehead Harbor	Lanesville	
Flax Pond		North River	Rockport Harbor	
Strawberry Brook		Porter River	Sawmill Brook	
		Proctor Brook	Walker Creek	
		Salem Harbor	Wolf Trap	
		Sawmill Brook		
		Waters River		

C1. Saugus River subwatershed

The Saugus River subwatershed occupies 47 square miles (122 km^2), originating at the outlet of Lake Quannapowitt in Wakefield. This Class B Treated Water Supply flows from the outlet at the lake in an easterly direction and forms the border between Wakefield, Lynnfield just west of Rt95/128. The river flows through the 540 acre Reedy Meadow where it is joined by Beaverdam Brook, which drains the central area of the town of Lynnfield. The river turns south, flows past the Colonial Golf and Country Club into an impoundment where the Lynn Water and Sewer Commission can divert the river as a water supply. The river receives flow from four tributaries in its freshwater reach including Beaverdam Brook, Mill River, Hawkes Brook, and Bennets Pond Brook. Below the Saugus Iron Works the river becomes a tidal estuary. Shute Brook discharges into the tidal Saugus River and is later joined by the Pines River. The tidal currents carry the river flow into Lynn Harbor, Broad Sound and Massachusetts Bay. The length of the river is 13 miles.

The 2003 Water Quality Report for the Saugus River Watershed found that 32% of the samples collected in failed to meet the federal water quality criteria for swimming, and 19% failed to meet the federal water quality criteria for boating. Approximately 10% of the samples collected were below the state recommended minimum of 5 mg/l of dissolved oxygen for a fresh water fishery. The watershed showed no significant problems associated with pH or conductance during 2003. The full document is available on www.NorthCoastal.net/ncw/Docs/

The Town Line Brook and its tributaries (Linden and Trifone Brook) drain into the Pines River before it meets up with the Saugus River. The Saugus River subwatershed includes Lake Quannapowitt and Town Line Brook which are detailed separately in sections C6 and C8 below. An NPS construction project is detailed in C10.

C2. Nahant Bay subwatershed

The Nahant Bay subwatershed is highly developed as urban and suburban land. Out of its total of 7,595 acres, 2,787 acres (or 36.7%) of the land is impervious surface and 62.2% of the land use is residential. Because of these and other factors, storm water runoff is a major issue here.

The Nahant Bay subwatershed includes seven communities, comprising major portions of Marblehead, Swampscott, Lynn and Nahant. It is divided up into four subwatersheds – Lynn Harbor, Nahant Bay, Phillips Beach, and Stony Brook. Although it is a highly developed area, the subwatershed contains about 1,010 acres of open space.

The subwatershed has three bodies of water on the Massachusetts section 303d list of impaired water bodies. Nahant Bay itself is on the list as well as Floating Bridge. (See Appendix F, category 5 waters).

C3. Salem Sound subwatershed

The Salem Sound subwatershed is a predominately urban area made up of six communities. The communities consist of Beverly, Danvers, Manchester, Marblehead, Peabody and Salem. The portion of Manchester that drains to Salem Sound is a mixed rocky and sandy beach coastline. The eastern portion of Beverly has large sections of sandy beach that are erosional zones, with few marshes.

With ten bodies of water on the Massachusetts section 303d list of impaired water bodies, water quality continues to be a main priority in this system. The major tributary to Salem Sound, the Danvers River, and two of its tributaries, Crane River and Waters River are on the list as well as two other tributaries to the Sound, North River and Forest River. It has 7,668 acres of impervious surface, or 27% of the entire system (total acreage 28,899 acres).

Salem Sound is divided up into thirteen sub-basins, several of which are small rivers that flow directly into the sea. They are as follows: Chubb Creek, Beverly Rocks, Beverly Harbor, Bass River, Frost Fish Brook, Crane River, Danvers River, Proctor Brook, Goldthwaite Brook, North River, Salem Harbor, Forest River and Marblehead Harbor. A large portion of Salem Sound is residential (42%) with 22% forest and 14% open land. It also has a significant amount of land dedicated to commercial, industrial, and transportation uses.

C4. Cape Anne subwatershed

The Cape Ann subwatershed is the largest system in the North Coastal Watershed at 38,558 acres. Gloucester, Rockport and communities southeast attract thousands of tourists each year. The coastline here is most noted for its rocky headlands and shallow soils covering ledge. Many people in this region depend on fishing (lobstering, finfishing, and shellfishing) and tourism. The upper North Shore, Ipswich and Essex, are most noted for their long barrier beaches, estuaries, salt and fresh water systems and poorly drained soils. Portions of Cape Ann include the Great Marsh Area of Critical Environmental Concern (ACEC). A total of eight communities make up the Cape Ann System. They include the above mentioned along with Manchester, Wenham, Hamilton and Beverly.

The land use is predominately forest at 51.9% with residential and wetlands at 22.1% and 10.5% respectively. While the total system has 2,634 acres (6.8%) of impervious surface, it is mostly concentrated in the coastal areas. The major routes include Route 128, 133, 127 and the commuter rail.

The Cape Ann System is divided in fourteen sub-basins. They are: Alewife Brook, Annisquam River, Beaches, Cat Brook, Chebacco Lake, Essex River, Gloucester Harbor, Good Harbor Beach, Halibut Point, Lanesville, Rockport Harbor, Sawmill Brook, Walker Creek and Wolf Trap. It has nine bodies of water on the Massachusetts section 303d list of impaired water bodies. These include Gloucester, Rockport and Manchester Harbors as well as Essex and Annisquam River. Some of the main issues in this area include development and growth rates along the coast as well as potential for growth inland. Major issues:

- Growth management
- Adequate Water Supply
- Shellfish Resources
- Harbor Redevelopment
- Combined Sewer Overflows

C5. Salisbury/Amesbury subwatershed

The Salisbury/Amesbury subwatershed is located in the northeastern corner of Massachusetts. Salisbury Beach, a popular and heavily visited recreation area, is a coarse sand barrier beach stretching from the Massachusetts/New Hampshire border to the mouth of the Merrimac River. Behind the beach is a salt marsh system that is part of the Great Marsh ecosystem.

The Salisbury/Amesbury subwatershed is the smallest in the North Coastal Watershed at 5,337 acres and is made up of largely forest and wetlands. Most of its residential areas are low to medium density with a higher density near the coastline. It has 468 acres (or 8.8%) of impervious surface and no bodies of water on the Massachusetts section 303d list of impaired water bodies. It is mostly located in Salisbury with a very small portion in Amesbury. It is divided into two sub-basins, Blackwater River and Smallpox Brook. A large industrial park is located adjacent to Smallpox Brook between I-95 and US 1. Constructed in 1973, wetlands were filled resulting in problems with drainage and sewage treatment. Another issue in this subwatershed is runoff from I-95 and US 1. Due to gaps in sufficient water quality data, this subwatershed could benefit from more studies in the future.

C6. Lake Quannapowitt *(Saugus River subwatershed)*

Background:

Reedy Meadow, a distinctive 540-acre freshwater marshland, along with Lake Quannapowitt form the headwaters of the Saugus River. Lake Quannapowitt in Wakefield is the largest lake (at 254 acres) of the 85 lakes and ponds in the watershed. Lake Quannapowitt was a water supply briefly in 1957 during a drought. Arsenic was introduced into the lake in the early 1960s to deal with aquatic weeds.

Water quality testing indicates that 65% of the phosphorous comes from storm drains, 22% from lake sediments, and the rest from direct runoff. Fertilizer and goose droppings are major sources of nutrients in direct runoff.

Beginning in 1999, the **Friends of Lake Quannapowitt** holds a watershed awareness program with an outdoor classroom for all children that graduate the public school system. The Friends of Lake Quannapowitt (FOLQ) website is at http://www.wakefield.org/folq/folq.htm

Action Items:

- The lake is overpopulated with Canada Geese. A program needs to be developed and implemented to reduce the geese population to a sustainable level.
- There is a problem with excessive weed and algae growth. The problem has been linked to excessive nutrient levels in the lake.
- Establishing a buffer zone along abutting streets (which currently offer no impediment to lawn fertilizer running directly into the lake during rain events).
- To improve the lake's quality to acceptable levels, the Town must address the stormwater problem. Treatment systems need to be developed and put in place.
- In the long term, arsenic contamination (from the 1960s weeding program) can only be removed by dredging. The flow rates in the lake are insufficient to remove heavy metals from the lake sediment, but sufficient so that leaching keeps measurable arsenic levels in some lake sections.

C7. Chebacco Lake *(Cape Ann subwatershed)*

Background:

Chebacco Lake is on DEP's integrated list of impaired waters under Category 4 ("Impaired b ynon-pollutants") and was formerly 303(d) listed (impaired). In 1999, DEM and Salem State College participated in a series of workshops and presentations on a study of Chebacco Lake. In 2003, the Chebacco Lake Association wrote a series of articles in the Hamilton-Wenham Chronicle to publicize the issues about the lake. Nearby residents claim that Chebacco Lake is contaminated. DEP has issued a fish contamination advisory. The lake has high mercury levels and problems with noxious plants including nonnative plants (fanwort). Residential development is claimed to be the main threat. The 303d listing indicates the lake is eutrophic and rated as:

- ? Fish consumption-non supportive
- ? Primary contact recreation 1/2 supportive, 1/2 unevaluated
- ? Secondary contact recreation- 1/2 supportive, 1/2 non-supportive
- ? Aesthetics- 1/2 supportive, 1/2 non-supportive

Action Items:

- ? Need to develop and implement a plan to control noxious plants and eliminate nonnative species.
- ? Need to develop and implement a plan to determine if excessive nutrients contribute to the plant problem. If excessive nutrients are present, develop a plan to identify the sources and control the nutrients.
- ? Develop a plan to identify and eliminate the sources of mercury.
- ? Locate sources of mercury within the lake and determine if they can be removed without increasing the environmental impact.

C8. Town Line Brook (Saugus River subwatershed)

Develop a plan to fund and implement the recommendations of the ***Final Report: Town Line Brook Hydraulics And Hydrology Study***

The authors found through modeling and qualitative analysis that several solutions could be implemented singly or in combination to provide a noticeable improvement in not only flooding, but also water quality, and habitat. These alternatives were compiled into a preferred approach. The alternatives consists of the following:

- ? Install tide gates at the Linden Brook culvert to make available additional storage (as much as 10 to 13 ac-ft) at high tide when the SRTs are not set closed.
- ? Install tide gates on Trifone Brook culvert to protect upstream areas from excessive downstream water surface elevations.
- ? Set SRTs to close at elevation 2' NGVD (they are currently permitted to close at 4' during the winter months and 5' during the summer).
- ? Create approximately 76.8 ac-ft of offline storage on the main channel in combination with wetland restoration consistent with adjusted SRT closing elevation.
- ? Dredge the channel of approximately 4000 cubic yards of sediment that have accumulated in lined reaches.
- ? Increase flood dike height to 9' NGVD at all locations.

Implement the report's recommendations for improving water quality including:

- ? Training sessions for state and local public officials.
- ? Community Meetings.
- ? Storm Drain Stenciling.
- ? On-Site Cleanup Projects.
- ? Natural History Events / Youth education programs.
- ? Pet Waste Initiative.
- ? Stormwater Best Management Practices.

C9. Lynn Woods (Saugus River and Salem Sound subwatersheds)

Lynn Woods consists of 2,200 acres of city-owned property plus 400 acres of surrounding woods. There are 40 miles of legal trails (although bicyclists often go off-trail, which is a problem). Lynn Woods contains four reservoirs, which is Lynn's water supply. The City of Lynn now employs a park ranger (Dan Small) so that many schools send field trips to Lynn Woods and the previous litter problem is diminished, so the woods are now in pretty good shape. Lynn Woods has a small invasive weed problem – knotweed, some Norwegian Maple, and loosestrife. Arsenic, which was introduced in the Lynn Woods, had no clear means of having been dispersed or removed, so a study might locate arsenic contamination.

C10. Saugus Iron Works (Saugus River subwatershed)

The National Park Service runs the Saugus Iron Works National Historic Site. The site covers 9 acres along both banks of the Saugus River. A large-scale restoration project is proposed, which would restore the half of the park alongside and in the Saugus River. The goal would be to restore the marsh and restore flow, but not in the main

channel (which requires a different permit). The actions would remove 18 inches of peat layer from phragmites, which clogs the flow and causes sedimentation. The intended result is that visitors would see open water flowing into the river rather than fields of phragmites. The area is the head of a tidal estuary, but is fresh, not saltwater.

The proposal is a Line Item Construction project in the federal budget (direct funding to the National Park Service), which requires NPS and presidential signatures. NPS will restore only the part of the river within its boundaries, but the project could server as a model for downriver, if successful. Anticipated schedule is to begin in September 2005 and complete by summer 2007. Funding level is approximately $2.6 million. The project is referred to as the "Turning Basin" restoration because the site is where the boats historically turned around. Three possible levels of restoration are proposed:

- A: Restore pier and bulkhead with no sediment removal
- B: Remove sediment from north only.
- C: Remove all sediment and eradicate phragmites
- D: Remove sediment based on elevation from tidal surveys

C11. Water Supply Boards (Salem Sound and Cape Ann subwatersheds)

The Salem-Beverly Water Supply Board has conserved water by the effective use of reservoirs for storage, supplied by the withdrawal of water from the Ipswich River during the winter when water levels are high, and stored for the summer month's use. Currently that same supply of water is greatly threatened by increasing usage. Much of the increased usage is from the development in areas north of Salem-Beverly. For example, Salem-Beverly sometimes sells water to Danvers in times of shortage. Towns farther north grow and increase their well water use, decreasing the groundwater levels and the flow of the Ipswich River. Beverly and Salem are the largest users, yet because most of the land in the two cities is outside of the Ipswich River Watershed, the Salem-Beverly water supply after usage is returned to the sea depriving groundwater supply replenishment. The Ipswich River is one of the most endangered rivers in the US. The health of this river affects our entire region.

The same applies to Gloucester, Manchester, and Rockport. Most communities in the NCW have some local wells – often secondary wells. Surface water protection and watershed aquifer protection are the issues for drinking water protection, management, and planning.

C12. Contaminated stormwater issues (all subwatersheds)

Background:

Contaminated stormwater emanating from street drainage systems along highways and local roads. Contaminated stormwater is estimated to account for over 50% of the water quality problems in Massachusetts.

EPA has begun the process of addressing the problem of stormwater contamination. Under the authority of Section 402(p) of the Clean Water Act, small cities and towns located in urbanized areas will be required receive a permit to discharge stormwater and to develop and implement a stormwater management program. The permits will by administered as Phase II Stormwater Compliance of the NPDES program. These drainage systems are referenced as "municipal separate storm sewer systems" or MS4's. Communities were slated to submit their respective plans in March of 2003.

The problem of contaminated stormwater emanating from street drainage systems along highways and local roads requires the coordinated involvement of municipal, state and federal authorities to achieve meaningful reductions in pollution loading. A related issue is contaminated urban sediments, particularly in the Salem Sound and Saugus River subwatersheds.

Lynn is under Joint Federal/State Consent Judgment Consent Judgment #76-2184-G to eliminate all CSOs and to address contaminated stormwater (in conjunction with the wastewater issue, below).

Essex has entered into Consent Judgment #96-2209B with the Commonwealth to address the discharge of pollutants from the town's storm drainage facilities into Essex Coastal Waters. A source of the pollutants has been identified as failing septic systems that are directly or indirectly tied into the storm drainage system. The town has agreed to implement a Core Area Water Pollution Abatement Program and submit a Wastewater Management Plan in accordance with the terms of the Final Judgment.

Action Items:

? A plan need to be developed and implemented to provide technical assistance and funding assistance for the implementation of municipal stormwater plans and to insure the consent judgments are completed in a timely manner. Efforts should be prioritized within the four targeted subwatersheds of the Saugus River, Salem Sound, Gloucester Harbor, and Smallpox Brook.

? Develop and implement a plan to install containment structures on all river crossings on state highways. The need was demonstrated when there was a rollover of a gasoline truck in 1992 on 93N right at the Ipswich River within yards of Reading's wells. It was a high-cost cleanup by Cumberland Farms and jeopardized Reading's entire water supply as well as the Ipswich River communities down stream.

? Encourage communities and watershed groups to take advantage of the U.S. Department of Agriculture's Natural Resources Conservation Service interest in working with communities to identify sources of stormwater contamination, and evaluate remedial options. They can meet with communities to determine goals and problems, conduct watershed site visits, help them set priorities,[10] carry out demonstration projects, and help prepare applications for funding through various grant programs.

C13. Impervious Surface runoff (all subwatersheds)

The major sources of runoff are individual actions with fertilizers and herbicides from lawns; and runoff of road salt, petroleum products, and heavy metals from impervious surfaces. Sediment runoff during rainstorm events affects fisheries heavily by filling in streambed interstices. It is estimated that each acre of impervious surface results in 20,000 gallons pf contaminated water.[11]

Citizens are generally unaware of the connection of their lawn maintenance on water quality in nearby lakes. A prime example is Lake Quannapowitt, where the NCW video documents that well-fertilized lawns lay 10 feet from the lakeshore. There are easy-to-use solutions for fertilizers and herbicides, so the primary issue is publicity about them. Establishing buffer zones along lakes in that situation would also be effective.

Road salting is a major issue. It impacts both surface and groundwater and alters habitat by changing chlorides and TSS. Lessons can be learned from Canadian BMP for road salt use. The future of the watersheds and habitats are linked to water quality. Road salt and impervious surface runoff is generally a more expensive issue because it involves town road maintenance rather than individual action.

One drinking water related example is the Lincoln Street Well in Manchester. It is a public water source and is a concern regarding road salt and runoff contamination. Its headwaters are along Rt. 128, and the well itself is next to a school parking lot and a golf course – many possible runoff sources!

C14. Wastewater issues (all subwatersheds)

Wastewater issues are specific to each community's wastewater system. Hence in this section we describe each system separately, and then describe action items to address them collectively.

? Salisbury completed an extension of its sewer main up Rt. 1A to the New Hampshire State Line. Property owners are in the process of completing ties into the system at this time. Town has applied for permits to extend sewer line up to the Salisbury Industrial Park.

? Lynn is under Joint Federal/State Consent Judgment, #76-2184-G, to eliminate all CSOs and to address contaminated stormwater.

? Rockport is currently under an Administrative Order # 835, which restricts the number of new connections to the system except in the case of written authorization by the Board of Health due to ground water compliance problem with outfall at Long Beach.

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[10] Contacts include Marc MacQueen, Soil Conservationist, USDA NRCS, 15 Cranberry Highway, West Wareham, MA 02576. Tel: (508) 295-1481 x 113 and Laurence N. Boutiette, Jr., P.E., USDA NRCS, 52 Medical Arts Building, Suite 100, 52 Boyden Rd., Holden, MA 01520-2587. Tel: (508) 829-4477 x 116.

[11] NRDC Kings County study

? Gloucester is under a Joint Federal/State Consent Decree to manage all of its on-site systems. This resulted in the city installing sewers in West Gloucester and the development and adoption of the Daylor Plan to identify areas for further sewering. The city is also focusing on eliminating CSOs in the Gloucester Harbor. The city has aggressively tackled the on-site problems, implemented a Wastewater Management Plan, and received funding through the Commonwealth's State Revolving Fund (SRF). The Gloucester Master Plan includes pricing of water so that business use is appropriate, and impact fees for new development.

? Essex has entered into a Consent Judgment, #96-2209B, with the Commonwealth to address the discharge of pollutants from the town's storm drainage facilities into Essex Coastal Waters. A source of the pollutants has been identified as failing septic systems that are directly or indirectly tied into the storm drainage system. The town has agreed to implement a Core Area Water Pollution Abatement Program and submit a Wastewater Management Plan in accordance with the terms of the Final Judgment.

? Manchester is under an Administrative Consent Order #844, which restricts the number of new connections into the system except by written authorization by the Board of Health and requires the town to conduct I&I removal operations and update the existing POTW. The Manchester POTW was upgraded from primary to a full secondary facility as of August 1998 per the requirements of the Administrative Consent Order AP-BO-92-101.

? South Essex Sewage District: the Beverly-Salem water treatment plant as of June 2004 removes its sedimentation filtration stream to SESD and maintains a lagoon for filter backwash, from which the solids are freeze dried and removed to landfill.

Action Items:

? Develop and implement a plan to provide technical and financial support to municipalities to improve compliance with all wastewater regulations, permits, consent orders, etc.

? Develop and implement a plan to provide technical support to help insure that all POTWs required to have a Local Limits program have one with a robust set of limits that address all water quality issues in their receiving waters and an enforcement program that insures compliance with all applicable limits.

C15. Blue Line Extension (Saugus River subwatershed)

The MBTA has proposed extending the Blue Line through Rumney Marsh to Lynn. No destruction is allowed of the ACEC. The entire marsh is a flood-prone area. Extending the Blue Line, say critics, has minimal transportation benefit because Lynn is already served by rail (commuter train to North Station – both the Rockport Line and the Newburyport Line). While recognizing the need for mass transit in general, critics also note that the MBTA parking garage in Lynn's Central Square is usually empty despite being free of charge.

C16. Agricultural Impacts (Cape Ann subwatershed)

Essex County farmland represents 8% of the landmass in the County (other counties in the watershed have lesser amounts of farmland, but the concepts are still applicable). There are 25,500 acres of land involved in agricultural production of which 12,500 acres are classified as prime land. Unfortunately farmland is under stress because average sales were $23,055 a year and 51% report a loss. The average age of farmers is now over 55 and only 3% are less than 35. Without support, farms will disappear and with them, access to fresh food, wildlife habitats, and open space.

Action Items:

? Agricultural Preservation Restriction (APR) program (see www.mass.gov/agr/landuse/APR/)
? Fund educational program / study of how farms benefit land use
? Find new opportunities for sustainable farm products
? Educate public on CSAs (Community Supported Agriculture) and location of farm markets
? Encourage "Buy Local" programs (see www.BuyFresh.org)
? Dialogue with businesses and environmental groups
? Visioning conference for protection of agricultural land
? Support website for local food / Buy Local
? Education and booths at festivals and fairs

Appendix D: Previous Goals

The Watershed Team defined the following list of goals and priorities in 2002, prior to the initiation of this Action Plan's process. It represents a snapshot of the priorities at the time, as well as a major source of input for the list of issues in the Action Plan.

Goal 1: Restore and Protect Water Quality

Restore and Protect the Water Quality of the North Coastal Watersheds' Rivers, Streams, Lakes, Ponds and Coastal Marine Waters.

Objective 1.1 Minimize point sources of pollution throughout the watershed

Proposed actions for the next five years:

- ? Eliminate CSOs in Gloucester complete separation of sanitary sewers from storm drainage systems
- ? Eliminate CSOs in LWSC complete sewer complete separation of sanitary sewers from storm drainage systems
- ? Implement recommendations of DEP's 1997/1998 Water Quality Assessment of the North Coastal Watersheds
- ? Reissue major NPDES permits recommend inclusion of receiving monitoring requirements into permits.
- ? Update minor NPDES permits.
- ? Implement Phase II MS4 compliance in all municipalities in the watershed.

Objective 1.2 Identify and minimize nonpoint sources of pollution throughout the watershed.

Proposed actions for the next five years

- ? Implement best management practices within Town Line Brook subbasins to address nonpoint pollution sources.
- ? Implement Beaches Bill to provide timely monitoring and protect the public health.
- ? Monitor water quality from stormwater drainage from Stacy Creek stormwater drainage system as it discharges onto the DCR (MDC) Kings Beach.
- ? Continue and expand stormwater monitoring through regular bacterial sampling of streams and outfalls in the Salem Sound watershed.
- ? Work with Salem Sound municipal and community partners to uncover the sources of this nonpoint pollution and remediate the problems.
- ? Assist MDMF to conduct sanitary surveys of the Rumney Marsh shellfish growing areas.
- ? Ground truth "Sites of Concern" data base **Priority Project**
- ? Incorporate Sites of Concern database into 2002 North Coastal Watersheds Assessment Report.
- ? Incorporate EPA bacterial survey of Smallpox Brook into 2002 North Coastal Watersheds Assessment Report.
- ? Develop TMDLs for NCW targeted subwatersheds.
- ? Conduct assessment study on thermal discharge impacts in Saugus River estuary.

? Work with DEP/ Phase II coordinators, Regional planners and municipal officials to develop funding mechanisms for funding Phase II storm drainage improvements and maintenance as recommended in. Phase II compliance. Project # 01-09/MWI **Priority Project.**

Objective 1.3 Remediate and prevent the spread of invasive species

Proposed actions for the next five years

? Conduct a survey of coastal marine waters for invasive species

? Evaluate the effectiveness of Purple Loosestrife eradication measures

? Target salt marsh areas for restoration and elimination of *Phragmites australis*

? Prioritize findings from synoptic surveys of 1997/1998 to develop remediation plans.

? Review current information on 303d waterbodies list in watershed

Goal 2: Build a Sense of Stewardship

Build a Sense of Stewardship within the watershed.

Objective 2.1 Expand the membership of the North Coastal Watersheds Team

Proposed actions for the next five years

? Partner with SRWC, USGS and Gomez and Sullivan to conduct Visioning conference on the Saugus River

? Develop a dialogue with local Chambers of Commerce

? Renew contacts with major industries within watershed

Objective 2.2 Strengthen regional and local watershed advocacy groups and activities

Proposed actions for the next five years

? Provide logistical and / or technical support for local activities.

? Advise team membership of grant opportunities provide letters of support for local projects which are consistent with Team goals and objectives.

? Support local cleanup projects.

? Attend MCM/NS monthly workshops for Boards of Health and Conservation Commissions.

? Attend monthly meetings of regional planning organizations where possible.

Objective 2.3 Promote environmental education and awareness

(at the municipal level and with the public at large)

Proposed actions for the next five years

? Continue Partnership with Project Link

? Apply for Roundtable funding to conduct a series of workshops for local boards to effectively address Chapter 40B

? Revisit with the assistance of MAS/NS water supply report card.

? Support circuit rider positions for local boards of health, conservation commissions

Goal 3 Improve Physical Functions

Improve the Watershed's Physical Characteristics and Functions

Objective 3.1 Reduce flooding events

Proposed actions for the next five years

? Implement recommendations by GeoSyntec Town Line Brook

? Complete hydrological study of Saugus River as part of GI RECONN proposal.

? Evaluate suitable methods to reduce flooding in Mill River.

? Upgrade drainage infrastructure of Saugus River downstream of LWSC Diversion to include removal of downed tree limbs, collapsed drainage structures at Spring and Water St Lynnfield, excess sediments in Rt128/Rt95 culvert collapsed retaining wall downstream of Rt 128/Rt95 and above Salem Street culvert.

? Evaluate the feasibility of reestablishing the original Linden Brook crossing under Rt 1 and the development of Overlook Ridge on the Malden/Revere boundary

? Complete hydrological study of Town Line Brook as part of GI RECONN proposal

? Complete hydrological study of North River as part of GI RECONN proposal.

? Assist Saugus River Watershed Commission in the implementation of an environmentally protective solution to the chronic flooding of Reedy Meadow.

? Reengage Smallpox Brook stream team, MHD and Fisheries and Game officials to establish remediation plans to improve flowage, reduce the proliferation of the invasive species Phragmites sp. as bordering vegetated wetlands.

Objective 3.2 Improve and enhance ecosystem functions

Proposed actions for the next five years

? Conduct a comprehensive natural resource assessment of the Reedy Meadow revisit feasibility of designating Reedy Meadow as an ACEC with DCR (DEM)

? Conduct feasibility / cost benefit analysis study to improve the functionality, responsiveness and the safety of operating the Town Line Brook self regulating tide gates.

? Implement a limited dredging of Town Line Brook between Trifone Brook and SRTs to increase flood storage and improve flood routing, incorporate enhancement of spawning habitat for anadromous fish into overall remedial plan.

Goal 4 Support Sustainable Growth

Support Sustainable Growth in the Watershed.

Objective 4.1 Continue regional land use planning

(including implementation to ensure protection of watershed resources and environment)

Proposed actions for the next five years

? Support the Green Neighborhood Alliance

- ? Fund a regional circuit rider position on the to assist municipalities in promoting zoning / planning boards in acceptance of Conservation Subdivision design as an alternative to Standard Subdivision planning.
- ? Resubmit as a Priority funded project a series of regional training sessions for local ZBAs, Planning Boards and other municipal officials on Comprehensive Permitting Chapter 40b.
- ? Fund a comprehensive assessment of land use at the subwatershed scale for the North Coastal Watersheds link "Sites of Concern" database into Assessment Report.

Objective 4.2 Plan for adequate water supply to meet growth in demand

Proposed actions for the next five years

- ? Revisit with the assistance of MAS/NS water supply report card.
- ? Conduct a watershed wide assessment of DEP's Comprehensive Survey of Public Water Supply

Objective 4.3 Redevelop abandoned and under utilized properties.

This topic will be considered by the NCW Team and developed accordingly.

Goal 5 Implement the Grow Smart North Shore Open Space Plan

Objective 5.1 Preserve open space and BIO Map core areas

This topic will be considered by the NCW Team and developed accordingly.

Objective 5.2 Provide for regional recreation opportunities

This topic will be considered by the NCW Team and developed accordingly.

Appendix E. Accomplishments of previous years

E1. Open Space

Accomplishments:

1998

Applied for Roundtable funding to Implement the concept of Sustainable Development in Land Use and Growth Management Foster the growing alliance of diverse and historically antagonistic land use stakeholders to work together to design innovative development strategies that protect water resources, and biodiversity while promoting development which is sustainable, of high quality, and profitable. Through upfront collaboration, this New Alliance will create a win-win situation where open space and the most critical water and biological resources can be protected and maintained while the number of lots developed can be maximized and the development costs and regulatory process reduced. Specifically, this project will solidify the growing alliance between conservation commissions, town planners, open space committees, realtors, developers and engineers to work together to develop a shared vision for water resources and land conservation. Funding is needed to develop planning tools and models and implementation strategies for communities to include: A complete build-out analyzes; for an extensive education and outreach program targeted towards professionals, municipal officials and volunteers about alternative design opportunities and the need for planning to promote acceptance of innovative development patterns and regional efforts which protect the North Coastal Watersheds' s remaining open spaces and water resources. **Priority Project**

1999

Recommended additional funding to acquire land within the Saugus River Watershed and the Great Marsh ACEC

Hosted leadership of Essex County Greenbelt, Trustees of the Reservation at North Coastal Watersheds Team meeting on open space planning

2000

Adopted the *Grow Smart North Shore* plan presented by Harvard School of Design and the MAPC/NSTF as the NCW comprehensive Open Space plan.

Executive Office of Environmental Affairs $1,000,000 in funds are committed annually to acquiring land respectively within the Saugus River Watershed and the Great Marsh.

Worked with DCR (MDC) and SWRC in the identification of suitable parcels of land for acquisition as part of the Saugus River Greenways Project.

Provided letters of endorsements grant submittals by the towns of Hamilton, Peabody, Saugus and Wakefield to EOEA Conservation Services for Open Space.

Wakefield was recently awarded a Self Help grant for $250,000 for the acquisition of the Lanai Island restaurant property located along the shores of Lake Quannapowitt.

Greenways and Trails Demonstration Grant Greenways and Trails Demonstration Grant Recipient: **Essex County Trail Association – Ipswich to Crane Beach Trail.** Project Summaries: Essex County Trail Association is working to create a safe, multi-use path from the Town of Ipswich to Crane Beach, linking natural, historical and recreational amenities along Argilla Road for people of all ages and all abilities. The goal is to locate a 4.2-miletrail within the public right of way while maintaining the scenic character of the road, protecting natural resources, and connecting to other regional trail initiatives. The trail will be designed primarily for walkers, joggers, slow speed bicycles and cross-country skiing in the winter. $5,000

Greenways and Trails Demonstration Grant Greenways and Trails Demonstration Grant Recipient: **Malden Redevelopment Authority – Bike to the Sea Survey.** Project Summaries: Bike to the Sea, Inc. (B2C) has been promoting efforts to place a multi-use trail along the inactive Saugus Branch Rail line. The trail will begin at the Mystic River near the Amelia Earhart Dam in Everett, cross through Malden, run along the Rumney Marsh ACEC in Revere and then traverse the Saugus River Reservation through Saugus and Lynn. B2C and the Saugus River Watershed Council (SRWC) funded a conceptual design of the trail. This grant will be used to develop the conceptual design into an engineering design and survey. $5,000 *Towns Affected: Everett, Malden, Revere, Saugus and Lynn.*

Applied for Roundtable funding for Sustainable Development/Growth Management As part of the North Coastal Watersheds team's overall approach to provide watershed communities with the necessary innovative tools and training to implement Sustainable Development/Growth Management techniques a request is made for $50,000 to implement this approach within a city and town work. In FY99, the team carried out an innovative growth management project that provided towns with a model public outreach program, innovative regulatory tools including a model bylaw, and build out assessment information. These tools are necessary for towns to adopt sustainable development practices to protect open space and natural resources. This approach promotes a development design that protects primary conservation interests within a parcel, while not sacrificing the density requirements of the developer thereby meeting both economic and environmental goals. Funding $25,000 for each community will be used to draft public outreach documents and conduct workshops, target specific stakeholders (developers, local officials, landowners and citizens). The citizens of that community will also use the money to revise applicable regulations tool specific to each municipality and work with the respective community Planning Boards and Executive Branch for approval. Projected costs $50,000 **Priority Project**

2001

The Teams efforts to deal with Open Space in coincided with the issuance of Executive Order 418 and the passage of the Community Preservation Act. The importance of Open Space was a feature issue in each of the local "Community buildout presentations ". The content of each presentation was coordinated with the local planning boards, relevant regional planning agency and EOEA Boston office to include significant local and regional open space issues. The presentations were typically 30 minutes in length before the Board of Selectman or City Counsel. We discussed the implications of full buildout on the community's open space, water quantity and infrastructure. We provided each community with details of how they could access the $30,000 worth of planning services provided under EO418. Provided an overview of the Community Preservation Act and linked the North Coastal Watersheds Initiative with the interests of Open Space, Historical Preservation and Affordable Housing.

Received funding through Roundtable to hire an "Open Space" circuit rider to work with communities **Regional Priority Project**

The NCW team leader as worked directly with DCR (MDC) Land Acquisition Agent Jim Comeau, SRWC and others in pursuing acquisition opportunities.

Successfully coordinated and conducted with MAPC, Merrimack Valley Planning Commission (MVPC) and EOEA Boston "local build out" and Community Preservation Act presentations with 16 communities within the NCW

Lynn Boston St land acquisition creation of 2-acre urban park SRWC, city of Lynn, DCR (MDC)

MDC land acquisition Walden Pond LWSC, Friends of Lynn Woods, MHD landowner

Self Help Grant to town of Manchester by the Sea to acquire "old Surf Restaurant site" for conversion to a park.

E2. Habitat

Accomplishments:

Much of the work has been sponsored by 8T&TB, Rumney Marsh ACEC Task Force, the Great Marsh ACEC Task Force and in cooperation with local communities, EOEA Wetlands Banking and Restoration Program (WBRP), MCZM/North Shore, SSCW, MAPC and MAS/NS. Team support has involved direct participation, site assessment and the writing of endorsement letters to the various funding sources. Estimated total acreage impacted 100 acres of salt marsh and 100 acres of shellfish beds.

Assisted in the presentation of a series of workshops (3) on Stormwater Best Management case studies at the local DPW level. MCZM/NS, MHD and ATP Environmental. **Regional Priority Project.**

Funded through EOEA WBRP salt marsh coordinator position $35,000 **Regional Priority Project**

Site restoration projects include:

Argilla Rd. Ipswich, installation of a larger culvert to increase tidal flooding and promote the regrowth of salt marsh and control the expansion of the invasive plants Phragmites sp.

Conomo Pt. Essex, installation of a larger culvert to increase tidal influences to promote the regrowth of salt marsh and control the expansion of Phragmites sp.

Installation of self regulating tide gates at 7 tidal crossings along Rt1A in Revere, improved flood control, healthier salt marsh, City of Revere, EPA, MCZM, RMTF, DEP/NERO/WW

Installation of self-regulating tide gates at Town Line Brook Revere/Saugus.

Proposed installation of a self-regulating tide gate structure at Oak Island, Revere. This project was funded by a grant from the USFWS. Progress towards the installation of a Self regulating tide gate structure at Oak Island, Revere and related work will result substantially improve tidal flowage and flood protection to the extensive Eastern County Ditch and the restoration of 30 acres of degraded salt marsh. Project has complex engineering and permitting issues, City of Revere, EOEA/WBRP, MBTA, DEP/NERO; project is partially funded by a grant from the USFWS.

Worked with multi agency task force in the development of the Ballard Street salt marsh restoration in Saugus Project has complex engineering and permitting issues EOEA/WBRP, EPA, RMTF, DEP/NERO/WW, DCR (MDC), and Town of Saugus, MHD.

Installation of Vortex Unit pollution control system to a stormwater drainage system discharging to the Forest River in Salem. The project was funded through a MCZM CPR grant to the city of Salem. Salem partnered with SSCW and engineering consultant Metcalf & Eddy to assist in wet weather monitoring

EOEA #12063 Rockport - Saratoga Creek Salt Marsh Restoration Project, between Saratoga Court and Seaview Street on Thatcher Road (Route 127). Phase II - restoration of 4,110 square feet of salt marsh and restoration of 880 square feet/1160 linear feet of mosquito ditching. An accumulation of sediments and intrusion of Phragmites have degraded the salt marsh area. 99-01/WRBP Sawmill Brook $ 6,200

Salisbury Blackwater Salt Marshes: an ACOE project that widened the RT 286 Bridge has resulted in increased flooding to Salisbury homes bordering the marshes. ACOE has been charged with the task of designing a structure or method to alleviate the increased flooding in the least intrusive manner as possible. The project has involved federal, state and local authorities. Permitting and design has been complicated.

Provided support of a MCZM CPR project to conduct water quality sampling of stormwater discharging to a MAS/NS "Thicket" Sanctuary in Nahant

Final Rumney Marsh Salt marsh Restoration Plan submitted for review and comment.

Town Line Brook Project A complex project within a 3500-acre subwatershed of the Saugus River. The long terms goals include, the reopening of 75 acres of grossly contaminated shellfish beds, minimizing flooding within abutting neighborhoods, eliminating chronic bacterial contamination due to sewer surcharging, restoration of 3 acres of degraded salt marsh TLB Advisory Board, TLB Task Force.

Submitted a total of four projects for funding under the USACOE General Investigation Reconnaissance Mass Bays (GI/ RECONN/MB) program for ecological restoration projects within the Saugus River, Town Line Brook, North River and Forest River. Projects would address anadromous fish restoration, flood protection,

pollution reduction, salt marsh restoration, SRWC, SSCW, communities Revere, Peabody, Lynnfield, Salem, Saugus,

Funded a 1-year monitoring program to optimize settings of the self-regulating tide gates at Town Line Brook Revere/Saugus. TLB MET $18,000.

City of Lynn

City: Lynn **Summary of Project:** The project at Sluice Pond is to control the spread of the non-native aquatic plant, Eurasian Milfoil, with the use of herbicides. The aquatic plant is affecting recreational pursuits and the ecosystem of the pond. Also included is an algaecide treatment to control filamentous algae in the pond. **Grant Award:** $3,500

Working with City of Gloucester, local residents, DEP/Wetlands/NERO and DCR (DEM) Office of Dam Safety to secure protection at the West Pond dam.

E3. Water Quality

1997 *Accomplishments*

The NCW team leader assisted **DEP WSM** personnel in development of an effective monitoring program, collected samples in accordance with the Quality Assurance Project Plan (QAPP) (DEP 1998a). Transported samples to the laboratory.

Engaged the services of agencies US Geological Services USGS and DCR (DEM) personnel to supplement the water sample collections with complimentary flow monitoring data for **DEP/WSM**, DMF and SRWC.

Worked with **City of Gloucester** Public Health officials and Massachusetts Audubon Society/NS on completing "Assessment of On-site Sewage disposal Related Pollution in Gloucester Waters" a 604b grant #96-02/604b $49,536.

Provided review and comment and a letter of support that assisted DMF in receiving a 104b grant #97-08/104 to expand the number of stations and water quality parameters in the DMF "Salem Sound Marine Resource Study."

Linked the DMF study and DEP/WSM studies by the inclusion of DMF's freshwater/tidally influenced water quality stations into the DEP/WSM sampling program for the North Coastal Watersheds. The effect was to increase the data collection at these key stations for both organizations.

Completed synoptic surveys of all lakes and ponds greater than 10 acres in size.

1998 Issues Water quality data collections by DEP/WSM were limited to once per month at roughly 20 stations. Data was largely reflective of summer and low flow conditions. In addition significant gaps existed in watershed-wide coverage, and in the frequency of sampling. All nine major NPDES permits have expired and need to be updated one of them the **General Electric plant** in Lynn has problems of non compliance associated with the release of oil and grease from its stormwater discharge system. Data exists in many different forms, has generally not been compiled, analyzed or formatted into status and trend assessments.

Strategies Extend the sampling rounds within the Salem Sound and Saugus River subregions into the winter and early spring season to provide data during higher flow conditions. Team Leader will serve as the principal conduit for the exchange of information and data between the various sampling programs during data assessment. Develop a comprehensive library of relevant reports, documents and studies applicable in the North Coastal Watersheds. **DEP/NERO** has concluded that the Watershed approach can be best administered within the Northeast by maintaining the Division/Section chain of command with respect to compliance and enforcement issues. It has expanded the Watershed approach to cover multi-media issues to include programs within the Bureau of Waste Prevention and Bureau of Waste Site Cleanup. The Municipal Services Section has been reformatted to provide for improved customer service and regional coordination for programs such as State Revolving fund (SRF), Title 5 Financial Assistance, Technical Assistance activities and outreach programs. Continue to provide logistical and technical support to DEP/DWPC/NERO staff on projects in the NCW.

The lack of recent watershed wide assessments and the inability to marshal sufficient resources suggests focusing efforts at a smaller scale. The NCW opted for the subwatershed scale. Lessons learned from managing the Commonwealth's s6217 Coastal Nonpoint Pollution Control Program suggested that the size of most watersheds was most conducive to engendering local *community* participation of municipal officials and citizens with respect to abilities and the availability of resources. The size of most subwatersheds allows for a thorough assessment of the problems. Incremental improvements can often be made at funding levels available through a number of grant programs that are readily available. The subwatershed scale also facilitates the establishment of procedures to properly evaluate success or failure with minimal influences. Link the local *community* interests with Federal/state and local programs and authorities, example select waterbodies included on the Commonwealth's 303d that exhibit common sources of impairment, utilize funds through 604b assessment studies to gather sufficient information to highlight a particular cause or source of impairment. Included in each assessment a list of suggested actions. Involve the local *communities* to discuss and contribute to the knowledge base, and map out the activities to affect resolutions. Foster and promote communications between the local *communities* and regulator *communities*, partnerships and leverage funds, seek common goals between *communities*. Prioritize efforts in four subwatersheds distributed across the watershed to promote spatial integration and facilitate collaboration problem solving on similar issues, include the areas targeted by DEP/WSM.

Accomplishments

Identified a potential inventory of 93 municipal and industrial NPDES wastewater discharges within the North Coastal Watersheds that need to be updated to reflect their current status.

Worked with DEP/NERO/GIS and **DFWELE Riverways** to develop a map of the North Coastal Basin and all its principal subwatersheds for use for outreach purposes, planning and in the development of subwatershed TMDL estimates.

The NCW team leader assisted **DEP WSM** personnel in development of an effective monitoring program, collected and transported samples to laboratory following an approved QAPP protocols.

Assisted DEP/DWPC/NERO and EPA Region 1 staff to update the files, reporting requirements necessary to bring the City of Lynn into compliance with the terms and conditions of their Consent Judgment #76-2184-G.

Collaborated with DCR (MDC), **Lynn Water and Sewer Commission (LWSC)** and DEP/DWPC/NERO on the monitoring of the Stacey Creek outfall and bacterial contamination at the DCR (MDC) beach.

Met with personnel from Endicott College and SSCW to improve QA/QC procedures for bacteria sampling and analysis.

Attended USGS sponsored presentation on their National Water-Quality Assessment (NAQWA) program study of urbanized watersheds. Initial planning and a "retrospective analysis" to review all existing information in the study unit will be performed during 1997 and 1998. This will be followed by three years of intensive data collection and interpretation. Primary reports will be completed in 2002, followed by two years of lower-level assessment activities. Although standard protocols for sampling are followed in all the study units nation-wide, there is some flexibility in the study design to address local issues. This is where the MADEP may wish to make recommendations for investigating areas of interest or concern identified by the watershed teams, etc. USGS will perform water quality sampling at both "integrator" (lower end of the watershed) sites and "indicator" (further up in the watershed) sites regularly for two years as well as adding some synoptic surveys to broaden the spatial coverage. Bed sediment and fish tissue analyses will also be performed. Finally, benthic invertebrate, fish, and algae population studies will be conducted. Fieldwork in this study unit is scheduled to begin in summer, 1998. Working with USGS and DEP/WSM recommended inclusion of the Saugus River in the study.

Assisted DEP/WSM staff in the preparation of the North Coastal Watersheds 1997/1998 Water Quality Assessment Report. Including data collected during the past year by MDMF, SSCW, Gloucester BOH, DCR (MDC), and SRWC.

Applied for Roundtable monies to conduct a Water Quality Assessment on 4 subwatersheds. The project description is as follows: select four subwatersheds which exhibit a common water quality or resource problem such as raw/dry weather sewage discharges, contaminated storm water, inadequate riverine buffers or invasive aquatic plant species. Compile, review and interpret pertinent data sets such as but not limited to water quality data, land use,

bioassessments, resource data, compile all references into a master compilation and 4 regional reference bases, identify data gaps to be addressed in next watershed cycle $50,000 **Priority Project.**

Collaborated with DEP/NERO personnel to work on the following community based projects:

Salisbury has recently completed an extension of its sewer main up Rt. 1A to the New Hampshire State Line. Property owners are in the process of completing ties into the system at this time. Town has applied for permits to extend sewer line up to the Salisbury Industrial Park.

Rockport is currently under an Administrative Order # 835, which restricts the number of new connections to the system except in the case of written authorization by the Board of Health due to ground water compliance problem with outfall at Long Beach.

Lynn is under Joint Federal/State Consent Judgment #76-2184-G to eliminate all CSOs and to address contaminated stormwater.

Gloucester is under a Joint Federal/State Judgment to correct on-site system failures in the North Gloucester area. Once the North Gloucester work is done, the city will then focus of the CSOs. To the city's credit, it has aggressively tackled the on-site problems, implemented a Wastewater Management Plan and received funding through the Commonwealth's State Revolving Fund (SRF).

Essex has entered into a Consent Judgment #96-2209B with the Commonwealth to address the discharge of pollutants from the town's storm drainage facilities into Essex Coastal Waters. A source of the pollutants has been identified as failing septic systems that are directly or indirectly tied into the storm drainage system. The town has agreed to implement a Core Area Water Pollution Abatement Program and submit a Wastewater Management Plan in accordance with the terms of the Final Judgment.

Manchester is under an Administrative Consent Order #844, which restricts the number of new connections into the system except by written authorization by the Board of Health and requires the town to conduct I&I removal operations and update the existing POTW. The Manchester POTW was upgraded from primary to a full secondary facility as of August 1998 per the requirements of the Administrative Consent Order AP-BO-92-101.

1999 *Accomplishments*

Conducted a Comprehensive Data Assessment in four (4) representative sub watersheds Saugus River, North River, Gloucester Harbor and Smallpox Brook. Contract awarded to the **North Coastal Alliance (SSCW, SRWC, MAS**) $49,992 #99-11 **Priority Project.**

Worked with Salem Sound 2000s "Clean Beaches Clean Streams" program by collecting concurrent bacteria samples from storm drains discharging onto local beaches and having them analyzed at the Commonwealths Wall Experiment Station. This allowed DEP to utilize its data in future legal proceedings and verify results obtained by SSCW.

Assisted DEP/DWPC/NERO staff in the collection of samples at CSO locations in Lynn and in bringing Lynn into compliance with the terms and conditions of their Consent Judgment #76-2184-G.

Culled outdated list of municipal and industrial NPDES wastewater discharges within the North Coastal Watersheds working with DEP/WSM permitting group DEP/DWPC/NERO, DEP/BWP/industrial branch and **USEPA Region 1 Permitting** section.

City of Gloucester Public Health officials and Massachusetts Audubon Society/NS on completed "Assessment of On-site Sewage disposal Related Pollution in Gloucester Waters" a 604b grant #96-02/604b. The tributary systems to the Annisquam River including Little River, Jones River and the Rust Island system were also sampled. The report indicates improving conditions (pre 1990 vs. post 1990 data) and lower bacteria counts in Hucks Cove.

Collaborated with DCR (MDC), LWSC and DEP/DWPC/NERO on the monitoring of the Stacey Creek outfall and bacterial contamination at the DCR (MDC) beach.

Applied for Roundtable monies to fund a study directed to addressing findings of the 1999 Priority Project Targeting and Eliminating Untreated Sewage Discharges in Four Subwatersheds in the NCW $60,000 **Priority Project**

Applied for Roundtable monies to assist local communities in their implementation of Phase II Stormwater Compliance requirements. VHB in their series of workshops on Technical Assistance for NPDES Stormwater Phase II Compliance (FY01 Priority Project MWI 01-09) **Priority Project.**

Applied for Roundtable funds directed to identifying contaminated or severely altered sites such as brownfield sites, Ch 21e sites, landfills or abandoned gravel pits which are suitable for reclamation and adjacent to open space or recreation areas. **Priority Project.**

2000 *Accomplishments*

Provided DWPC/NERO and DEP/WSM with finalized list of 9 major NPDES permittees and 27 minor discharge permits. (For a complete list see Appendix I).

Team Leader collected bacteria samples from street drains discharging onto local beaches within greater Salem Sound to assist DEP/NERO in the verification of chronic bacterial contamination documented by the SSCW *Clean Beaches Clean Streams* monitoring program.

Worked with DEP USEPA and General Electric Lynn to receive permitting approval to upgrade stormwater system to capture and treat dry weather flows and oil and grease currently discharging to Saugus River estuary.

As part of Phase I of the LWSC CSO facilities plan, the flow coming from the Lynn side of the system was separated from the Swampscott side of the drainage. The Sanderson Avenue overflow discharges approximately 200 MG/year of CSO (without Phase I separation) at a frequency of approximately 40x/year. Upon completion of Phase II, outfall #006 will be eliminated.

Served on the Town of Essex Facility Planning Task Force.

Worked closely with the DEP's Division of Watershed Management to produce

North Coastal 1997/1998 Water Quality Assessment Report.

Worked with the North Coastal Alliance by providing data sources, review and comment for the report entitled "*North Coastal Alliance Water Quality Assessment in four targeted subwatersheds Gloucester Harbor, North River, Saugus River and Smallpox Brook."#99-11* **Priority Project**

Applied for Roundtable funding to conduct an inventory and evaluation of Brownfield sites for Redevelopment or Land Reclamation Brownfield sites within the NCW **Priority Project**.

Provided review and comments to the MDMF draft study of "*Marine Resources of Salem Sound."*

Participated in the SSCW sponsored *Symposium on the State of Salem Sound.*

Worked with DEP's Bureau of Waste Site Control, William X Wall Experiment Station and the Friends of Lake Quannapowitt in the collection of sediment samples from the lake to supplement a Phase I Initial Site Investigation, Tier Classification and Imminent Hazard Evaluation of a former coal gasification plant.

Assisted DEP/MS and the consulting firm of URS Consulting Group in crafting the scope of work, Quality Assurance Project Plan and in providing them local community contacts for a project entitled "Targeting and Eliminating Untreated Sewage Discharges in Four Subwatersheds in the North Coastal Watersheds."

Project #00-08/MWI $60,000 **Priority Project**.

2001 *Accomplishments*

SSCW completed an approved EPA/ DEP Quality Assurance Program Plan to complement their successful "*Clean Beaches Clean Streams"* monitoring program. Documented results include, the elimination or reduction of bacterial contamination emanating from storm drains and the issuance of Notices of Non Compliance by DEP/NERO to the cities of Beverly and Salem, EPA, DEP/WSM,

Continued assisting the communities of Essex and Gloucester towards completion of an intermunicipal agreement to pump wastewater from the town Essex to the Gloucester's wastewater treatment system, Essex/Gloucester Task Force, DCR (DEM). The agreement benefits both communities and eliminates the potential discharge of municipal wastewater to the Essex River and the Great Marsh ACEC.

Removed an estimated 10 tons of debris from Town Line Brook during 2 days of volunteer cleanup, organized by SRWC, participants included City of Revere DPW, DCR (MDC), MA State Representative Kathi Ann Reinstein, Revere Mayor Ambrosino, GE, RESCO and 130 volunteers,

MCZM awards 3 Coastal Pollution Remediation grants, Cities of Revere, Trifone Brook (FY2000, $30,000), Trifone Brook (FY 2001, BMP implementation $20,000), Malden, Linden Brook (FY 01, $30,000) tributaries to Town Line Brook. Cities of Revere, Malden, Everett, TLB Advisory Group, SRWC, engineering consultants ATP Environmental and GeoSyntec,

Assisted DEP and the consulting firm of URS Consulting Group in rescoping a project entitled "Targeting and Eliminating Untreated Sewage Discharges in Four Subwatersheds in the North Coastal Watersheds" communities of Gloucester, Salisbury, Salem, Peabody, and Saugus. Project #00-08/MWI **Priority Project.**

Collected and analyzed sediment samples from Town Line Brook in concert with engineering consultant GeoSyntec and the Massachusetts DEP's Bureau of Waste Site Control, William X. Wall Experiment Station TLB Task Force,

Conduct an inventory and evaluation of Brownfield sites for Redevelopment or Land Reclamation Brownfield sites within the NCW, Boston and NERO BWSC, EOEA Brownfield Coordinator, USEPA, $28,445 Daylor Associates, EOEA **Priority Project**

Contracted with engineering consultant Vanasse Hangen Brustlin (VHB) to conduct a series of workshops and provide technical assistance to 15 watershed municipalities to their implementation of NPDES Stormwater Phase II Compliance (FY01 Priority Project MWI 01-09) $54,000 **Priority Project**

Attended NAWQA/USGS Urban Rivers Workshop,

Worked with MCZM, SSCW and SESD in approval to fund the development of a Pollutant Transport Model for Salem Sound study by Engineering consultant ASA.

Continued assisting DEP/NERO/Municipal Services and Lynn Water and Sewer Commission in removing pollution sources within the municipal wastewater and storm drainage systems.

General Electric Lynn upgrades stormwater system to treat dry weather flows and reduce the discharge of oil and grease.

Continued assisting DEP/NERO/Municipal Services and City of Gloucester in removing pollution sources within the municipal wastewater and storm drainage systems.

Removed an estimated 3 tons of debris from tidal/fresh reach of North River during a volunteer cleanup organized by Massachusetts Community Water Watch Partnership, sponsored by SSCW, participants included City of Salem DPW and students from North Shore Community College. Located and reported to DEP/DWPC/NERO an illegal sewage discharge.

Worked with DEP BWSC and FOLQ in development of a Phase I Initial Site Investigation, Tier Classification and Imminent Hazard Evaluation of former coal gasification plant Lake Quannapowitt, Wakefield.

City of Gloucester and town of Rockport have entered into an intermunicipal agreement to connect the Long Beach section of Rockport into the City of Gloucester Wastewater treatment system. The agreement benefits both communities and eliminates a long outstanding pollution problem attributed to poor individual subsurface disposal facilities.

2002 The team's strategy to addressing contaminated stormwater will continue along several fronts. Efforts are prioritized within the four targeted subwatersheds of the Saugus River, North River, Gloucester Harbor and Smallpox Brook. However we will assist efforts elsewhere within the where community interest and support is active. *Our strategy going forward is to assist* the NCW communities in the development and implementation of Phase II Stormwater Plans that meet the EPA requirements and the targeted dates for submittal of March 10, 2003.

Accomplishments

We have provided to DEP Phase II coordinators all of the materials developed and presented by consultant VHB in their series of workshops on Technical Assistance for NPDES Stormwater Phase II Compliance. These materials and follow up assistance by the NCWT should allow DEP to better serve the NCW communities with

timely and up to date assistance consistent with their needs and progress towards meeting Phase II compliance. Project # 01-09/MWI **Priority Project.**

Applied for Roundtable monies to provide technical assistance to local communities in stormwater mapping incompliance with NPDES Stormwater Phase II requirements. **Priority Project**

Work with communities who have applied for DEP/SRF grants for implementing Phase II stormwater management plans

Coordinated with USEPA region 1 NPDES permitting Program, DEP/WSM NPDES permitting program, MDFM, GE Lynn and RESCO to examine potential for synergistic effects of thermal discharges on anadromous fish migrations in the Saugus River.

Continue technical assistance and support for the Town Line Brook Project. A complex project with long terms goals of reopening of 75 acres of grossly contaminated shellfish beds, minimizing flooding within abutting neighborhoods, eliminating chronic bacterial contamination due to sewer surcharging, restoration of 3 acres of degraded salt marsh TLB Advisory Board, TLB Task Force.

DEP/NERO has recently indicated that it will be establishing a Task Force to oversee the release of RESCO Penalty funds for remediation projects within the Rumney Marsh ACEC. Funds are estimated to be in excess of $600,000.

The FY01 Priority Project Prioritize Brownfield sites within the NCW will be completed within this calendar year the NCWT will work with the data base, DEP/BWSC and local communities to test its' applicability for tracking brownfields at the community and regional levels and the relationship to sensitive resources as identified in the "Bio Mapping Project of Core Habitats and Supporting Natural Landscapes within the NCW.

E4. Water Quantity

1997 *Accomplishments*

DEP conducts underground injection control inspections and Zone II delineation for wellhead protection.

DEP to review water supply permits, new technology approval permits, water treatment permits, and cross connection permits.

Accomplishments

Project establishing a minimal base flow for the Saugus River. Project Description:

The Saugus River serves as a Drinking Water Supply largely under the control of the Lynn Water and Sewer Commission (LWSC). A series of legislative authorities granted in the late 1800's provide the LWSC considerable latitude in diverting river water into its reservoir system. The upper reach of the Saugus River is frequently plagued by chronic low flows during the summer months as water is diverted into the LWSC reservoir system. Elevated water temperatures, low dissolved oxygen concentrations, dry river beds and poor biological diversity are all documented evidence of excessive water withdrawals. The US Geological Survey (USGS) as reestablished a flow-monitoring gauge at the Saugus Iron Works. Previous funded studies have recommended the establishment of a minimal flow requirement (Tashiro et al l991). There is a priority need to establish what the minimal base flow should be in order to improve the ecological health and designated uses of this valuable resource. $60,000 **Priority Project.**

DCR (DEM)'s **Office of Water Resources** will be reviewing demand projections for the basin in conjunction with **DEP's** Water Management Act five-year review. Particular focus will be directed to Water Supply issue affecting the Saugus River withdrawals.

The entire North Shore has experienced serious drought conditions for much of the year. The NCW team followed the lead of the Ipswich Watershed team and provided bulletins and informational brochures to local water suppliers and users on water conservation practices.

Team members participated in a daylong forum sponsored by Cape Ann sustainable Growth Committee (CASC) on protecting Cape Ann's water supplies

The team leader has worked with DEP/NERO/Drinking Water Program in reviewing and assessing compliance with Water Management Act permit requirements.

Accomplishments

In July 1999 DCR (DEM) issued a contract to conduct a $60,000 study entitled "Impacts on Stream flows in the Saugus River from Human Manipulation." Funding for the project was received through the Roundtable for FY99 and work began in July 1999. However project oversight highlighted problems with the original contractor and the contract was terminated. Working closely with DCR (DEM), the Lynn Water Sewer Commission, the Saugus River Watershed Council and the Saugus River Watershed Commission, the contract was readvertised and a new vendor selected. Substantial progress towards meeting the original goals set out in the Scope of Work have been made since the contract was reissued $60,000 **Priority Project**.

The NCW team leader has worked closely with the DEP/NERO Drinking Water Program in the review and reissuance of Water Management Act permits within the NCW.

Worked with town of Rockport and Drinking Water Program on their Source Water Protection Program (SWAP).

Worked with MAS/NS on a "Water Supply Report Card" for Cape Ann municipalities.

Accomplishments

The NCW team leader has worked closely with the DEP/NERO Drinking Water Program in the review and reissuance of Gloucester Water Management Act permit.

2001 Accomplishments

Continued working with DCR (DEM) hydrologist Linda Marler, engineering consultant Gomez and Sullivan to complete a FY99 Roundtable entitled "Impacts on Stream flows in the Saugus River from Human Manipulation." Noteworthy assistance has been provided by Richard Dawe Supervisor LWSC Water Division, SRWC, USGS, Kellie OKeefe of the DEP/NERO Water Management Act program **Priority Project.**

In addition, the NCW team leader has worked closely with the DEP/NERO Water Management Act program in the review of WMA permits throughout the NCW.

Source water Protection grant Crystal Lake awarded to town of Wakefield 9-07/SWT $40,000

E5. Recreation

The team had not identified the element of recreation as a specific priority issue to be addressed by the team at this time. Often it is imbedded or included in open space planning and habitat issues. In the current Action Plan, recreation has been added as a goal, along with the economic aspects pertaining to increased recreation.

E6. Local Capacity Building

1997 Accomplishments

Worked with **City of Gloucester** Public Health officials and Massachusetts Audubon Society/NS on completing "Assessment of On-site Sewage disposal Related Pollution in Gloucester Waters" a 604b grant #96-02/604b $49,536.

Provided stakeholders a public forum for their integration into the Massachusetts Watershed Initiative.

1998 *Accomplishments*

Salem Sound 2000 awarded a Capacity Building Grant $50,000.

Formation North River Stream Team by **Riverways DFWELE**

SSCW awarded 604(b) Grant "watershed Assessment for Four North Coastal Sub-Watersheds $49,992 **Priority Project.**

Funded the presentation of a series of workshops on Stormwater Best Management case studies at the local DPW level, **MCZM/NS**, MHD and ATP Environmental $30,000 **Regional Priority Project.**

Funded a program that sought to Implement the Concept of Sustainable Development into Land Use and Growth Management. **MCZM/NS**, MAPC, 8T&B, MAS $60,000 **Priority Project.**

1999 *Accomplishments*

Applied for Roundtable monies to organize a series of interactive forums (5), targeted to reach local officials, environmental groups and concerned citizens to present information compiled from a previous grant on the pollution sources, environmental conditions and natural resources within 4 subwatersheds. This project is seen as a natural progression from the funding of the 604b-assessment grant funded in fy99 entitled "Comprehensive Data Assessment in four (4) representative subwatersheds in the North Coastal Watersheds." One of the keys to the success of the project is to continue the forging of working relationships between stakeholders across the spectrum of interests. This will be accomplished by the establishment of partnerships between the Watershed team leader and team members, key staff people in each community. Utilizing and building upon previous successful work efforts the team will convene an "introductory forum" bringing together targeted municipal staff from each community and the team to explain the overall goals and approach of the project and the deliverables they can expect based on their participation. $18,010 #00-09/MWI **Priority Project.**

Assisted in the presentation of a series of workshops (3) on Stormwater Best Management case studies at the local DPW level. MCZM/NS, MHD and ATP Environmental. **Regional Priority Project.**

Provided to the town of Rockport grant information to assist town in development of new water supply.

Met with leadership of Friends of Lake Quannapowitt to map cooperative efforts.

Attended "kick-off" meeting of local community leaders and Representative Peterson for Salem Sound 2000 innovative Clean Beaches and Stream Program.

Volunteer Monitoring Grants (2) awarded to SSCW in support of Clean Beaches and Stream Program $5,000 and $1,450.00.

2000 *Accomplishments*

DCR (DEM) Coastal Grants Access Grants Program $5,000.

MWI Watershed Stewardship Grant awarded to SSCW Clean Beaches and Stream Program Education and Monitoring $40,000.

Attended and assisted in the organization of the State of Salem Sound Symposium: Current Knowledge and Future Directions.

Meeting with **Gloucester City councilor** mapping out cooperative strategies on key issues

The North Coastal Alliance formed by SSCW, MAS/NS and the SRWC organized a series of interactive forums (5), targeted to reach local officials, environmental groups and concerned citizens with information compiled during previous grant about the pollution sources, environmental conditions and natural resources within 4 subwatersheds, North River, Saugus River, Gloucester Harbor, and Smallpox Brook. This will be accomplished in one general introductory forum and four individual community forums-one for each watershed. Forums provided North Coastal Watersheds Team with a set of objectives for each of the subwatersheds. $18,010 Project #00-09/MWI **Priority Project.**

The Smallpox Brook subwatershed forum prompted the formation of new Stream team. Participation included Salisbury residents, members of the local Board of Health, Selectmen, and the Salisbury Director of Planning. They recently completed a stream walk with assistance and training of the Riverways Program, 8T&B, and the NCW team leader. **Priority Project**

Attended meetings with **DEP/NERO**, MCZM, Massachusetts State Attorney General's office and Massachusetts Environmental Trust (MET) to determine an appropriate recipient of a Supplemental Environmental Penalty (SEP) $500,000.

Succeeded in securing the (SEP) for the **City of Revere** to address chronic flooding and pollution of in the Town Line Brook subwatershed.

Established the Town Line Brook Task Force, membership included the MCZM, DCR (MDC), DWPC/NERO, MHD, MET, **USEPA Region 1**, City of Revere, GeoSyntec Consultants.

Established Town Line Brook Advisory Group MCZM shellfish program, DCR (MDC), DWPC/NERO, MHD, MDMF, SRWC, City's of Revere, **Malden** Everett, **NRDC**. Group is dedicated to the reopening of the shellfish beds in the Rumney Marsh ACEC downstream of Town Line Brook and salt marsh mitigation.

Team leader met with the Project Coordinator for the Gloucester Harbor Plan to offer the team's assistance in the Gloucester Harbor on a number of issues including stormwater management, the elimination of Combined Sewer Overflows (CSOs) and the siting of the Yankee Whale Watch Fleet in Gloucester Harbor versus Annisquam River. The meeting was directly related and in response to the forum by North Coastal Alliance on Gloucester Harbor. Priority Project**.**

The team helped alert MAS/NS and MAPC to citizen and community requests for assistance in protecting open space land in Nahant.

2001 Accom*plishments*

Volunteer Monitoring Grant awarded to SSCW in support of Clean Beaches and Stream Program $5,000

Salem Sound 2000 Volunteer Monitoring QAPP receives final approval by DEP

Partnered with Saugus River Watershed Council, City of Revere and Malden, RESCO, **GE Lynn** and Honorable State Representative Kathi – Ann Reinstein on two major cleanup days on Town Line Brook.

Partnered with Massachusetts Community Water Watch Partnership and Salem Sound 2000 for cleanup of North River.

Conducted a series of workshops and training sessions for communities in the North Coastal Watersheds to implement Stormwater Compliance Phase II Plans consultant firm Vanesse Hagen and Brustlin **Priority Project** $47,305

Met with EOEA Wetlands Restoration Program leadership, MCZM personnel USACOE and other regarding the possibility of targeting GI RECONN funds to conduct large scale coastal restoration programs.

Town of Nahant received a Coastal Pollution Remediation grant from MCZM partnered with SWIM and MAS/NS to conduct a study on stormwater contamination impacts to Massachusetts Audubon Society sanctuary called the *Nahant Thicket.*

2002 *Accomplishments*

Volunteer project with **MDMF** to improve smelt spawning habitat in North River.

Met with **Wakefield** town officials, DEP 319 grant coordinator and consultant Vanesse Hagen and Brustlin to map potential future activities directed to implementation of Phase II requirements.

E7. Outreach and education

1997 *Accomplishments*

Sent out roughly 500 questionnaires to the environmental *communities* servicing the North Coastal Watersheds.

Began to compile a reference library of reports, studies open space plans (local and regional), water quality /quantity assessments, public records, documents on pollution sources, loadings, disposal methods specific to the North Shore.

Conducted field trips out to **Saugus River Watershed Council, Salem 2000 and Eight Towns and Bay** to determine their priority needs with respect to the 7 program elements.

Organized and conducted the first EOEA Basin Team meetings.

Presented the Watershed Approach at the annual Boards of Health Workshop in Wilmington.

Presented an overview of the North Coastal Basin water quality issues to annual meeting of Department of Environmental Forest and Park Super**visors.**

Participated in WATERSHED 97 FORUM. Organized by the **Department's Municipal Assistant Program**, the forum was targeted to TOWN GOVERNMENT and the BUSINESS community to help dispel the lack of understanding as to what DEP's typical enforcement /regulatory role is vs. the new partnership with the community regarding non-point sources of pollution and watersheds.

Team leader was an attendee to meetings of the Rumney Marsh Task Force, SSCW Technical Advisory Committee, North Shore Workshops for Health Agents and Conservation Commissions, Eight Towns and the Bay, Saugus River Watershed Council, and Essex Facility Planning Task Force.

1998 *Accomplishments*

Worked closely with **DEP/NERO/DWPC** and **City of Lynn** on improving compliance with Administrative Consent Order.

Participated in a series of workshops, forums and scoping sessions that lead to the formulation of the Great Marsh Task Force.

Worked closely with town of **Saugus officials,** DCR (DEM) Office of Waterways**,** US Army Corps of Engineers, RESCO and **Rumney Marsh Task Force** to receive approval for maintenance dredging of Saugus River channel to Town Landing.

Met with leadership of Center for Marine Science and Technology (CMAST) about conducting research on the North Shore as well as educational opportunities.

Presentation before the Northeast Builders Association on stormwater detention practices.

Set up meeting with City of Revere officials, and DWPC/NERO personnel to conduct site walk of chronic flooding sewer overflows along Town Line Brook.

Attended Legislator night in Danvers provided over view of Watershed Initiative

Team leader is an attendee to meetings of the MAPC North Shore Task Force (NSTF), Salem Harbor Task Force, Cape Ann Sustainable Committee (CASC), Great Marsh Summit Team, Rumney Marsh Task Force, North Suburban Planning Commission (NSPC), SSCW Technical Advisory Committee, North Shore Workshops for Health Agents and Conservation Commissions, **Friends of Lake Quannapowitt (FOLQ)**, Eight Towns and the Bay, Saugus River Watershed Council, Saugus River Watershed Commission and Essex Facility Planning Task Force, **Safer Waters in Massachusetts (SWIM).**

1999 *Accomplishments*

Attended Massachusetts Watershed Coalition Annual meeting Sterling, MA.

Presentation to the annual conference of Massachusetts Waste Treatment Plant Operators on the Massachusetts Watershed Initiative.

Attended meeting of UMass Urban Harbors Program to discuss the possibility of collaborative efforts in research and education.

Team leader is an attendee to meetings of the MAPC North Shore Task Force (NSTF), Salem Harbor Task Force, **Cape Ann Sustainable Committee (CASC)**, Great Marsh Summit Team, Rumney Marsh Task Force, North Suburban Planning Commission (NSPC), SSCW Technical Advisory Committee, North Shore Workshops for Health Agents and Conservation Commissions, Friends of Lake Quannapowitt (FOLQ), Eight Towns and the Bay, Saugus River Watershed Council, Saugus River Watershed Commission and Essex Facility Planning Task Force, Safer Waters in Massachusetts (SWIM).

Participated series of workshops and presentations with DCR (DEM), Salem State College on a study of Chebacco Lake.

Attended a three-day Training workshop on conflict resolution.

Received front-page coverage on the environmental issues affecting the Saugus River Watershed in the newspaper *Saugus Advertiser.*

Manned booth for MWI/NCW at the Topsfield Fair.

Participated in Fall Watershed Forum sponsored by the Cape Ann Sustainable Communities (CASC).

Stream Teams Manchester Sawmill Brook, Marblehead Babbling Brook, Riverways Program DFWELE

SSCW Program Director Jeremy Sokulsky, produced a video entitled "Salem Sound our Heritage, our Future", received this year's New England Water Environment Association's award for outstanding public education.

Town of Wakefield & Friends of Lake Quannapowitt Lakes and Ponds grant **Summary of Project:** The project at Lake Quannapowitt is to continue the watershed awareness program with an outdoor classroom for all children that graduate the public school system. Also included is the update of the existing lake and watershed management plan to include issues that have occurred in the last five years. **Grant Award:** $4,400

2000 *Accomplishments*

In cooperation with North Coastal Alliance conducted series of public forums on the environmental problems affecting four (4) subwatersheds, Saugus River, North River, Gloucester Harbor and Smallpox Brook. The forums provided the opportunity for the exchange of knowledge and concerns between regulators and the public.

#00-09/MWI **Priority Project.**

Attended Public Hearing in Gloucester on Essex / Gloucester Sewer tie-in proposal

The Saugus River subwatershed forum earned full-page coverage in the Lynn Daily Item newspaper.

Presentation on the MWI and the North Coastal Watersheds at the Friends of Lake Quannapowitt (FOLQ) annual meeting.

Meeting with DCR (DEM) Office of Dam Safety on outstanding problems in the North Coastal Watersheds, development of cooperative strategies.

Attended Massachusetts Coastal Zone and Massachusetts Watershed Initiative program update.

Attended training session on providing Buildout Presentations to Massachusetts Communities.

Attended three-day workshop on "Facilitating Collaborative Problem Solving

Team leader is an attendee to meetings of the MAPC North Shore Task Force (NSTF), Salem Harbor Task Force, Cape Ann Sustainable Committee (CASC), Great Marsh Summit Team, Rumney Marsh Task Force, North Suburban Planning Commission (NSPC), SSCW Technical Advisory Committee, North Shore Workshops for Health Agents and Conservation Commissions, Eight Towns and the Bay, Saugus River Watershed Council, Saugus River Watershed Commission and Essex Facility Planning Task Force, Safer Waters in Massachusetts (SWIM).

Team leader served as liaison between the EOEA Boston Office, DEP/NERO Wetlands Program and a disgruntled citizen.

Met with Boards of Health bordering Salem Sound and SSCW to discuss results of Clean Beaches and Stream sampling program. Lobbied for an increase in municipal efforts to curtail or eliminate pollution sources.

2001

The NCWT entered into 2nd round of the Massachusetts Watershed Initiative's 5-year cycle. The **targeted activity** in the first year of the each cycle is to initiate new outreach and education activities. The timing coincided with the issuance of Executive Order 418 and the passage of the Community Preservation Act in the fall of 2000. EOEA Secretary, Bob Durand used the opportunity to launch a statewide effort to protect open space, retain our historical heritage and provide long term planning for growth. He further directed all twenty-seven (27) Watershed Teams to assist in providing to all of the communities a presentation on what the community could look like under "full buildout conditions." The presentations would also be used to introduce the municipalities to the Community Preservation Act. We chose this opportunity to combine Secretary Durand's directive with an introduction to the North Coastal Watershed Initiative to all communities within the North Coastal Watersheds.

The strategy has been:

To establish contact with local government officials through the existing team contacts

To combine the EOEA local buildout / CPA presentations with NCW Work Plan Initiatives

Accordingly, each presentation included specific examples the North Coastal Watersheds Initiative activities in their community, a "full buildout analysis" and a presentation on the Community Development Planning process. The content of each presentation was coordinated with EOEA Boston office, local planning boards, NCW team members and the relevant regional planning agency. The presentations were typically scheduled before the Board of Selectman or City Counsel and ran for 30 minutes. Each presentation included the implications of full buildout on the community's open space, water quantity and infrastructure. The local officials learned how they could access $30,000 in planning services provided under EO418, provided with an overview of the provisions of Community Preservation Act and sources of assistance. All communities received a set of buildout maps, workbook and computer disk (CD) containing all of information described above.

Accomplishments

Implemented Secretary Durand's promise to hold Local buildout presentations in 16 of 17 targeted communities. Presentations conducted in cooperation with MAPC, MVPC, EOEA and community planning officials.

Yankee Council Boy Scouts Environmental Summer Camp presentations in collaboration with SSCW, Massachusetts Department of Environmental Protection Bureau of Resource Protection and Bureau of Waste Site Control,

Project Link a cooperative educational effort of the Essex and Manchester School Districts, Massachusetts Division of Marine Fisheries, Project Link Limited, and Center for Marine Science and Technology (CMAST).

Team leader is an attendee to meetings of the MAPC North Shore Task Force (NSTF), Great Marsh Summit Team, Rumney Marsh Task Force, North Suburban Planning Commission (NSPC), SSCW Technical Advisory Committee, North Shore Workshops for Health Agents and Conservation Commissions, Friends of Lake Quannapowitt (FOLQ), Eight Towns and the Bay, Saugus River Watershed Council, Saugus River Watershed Commission and Essex Facility Planning Task Force, Safer Waters in Massachusetts (SWIM) Water Resource Commission (WRC).

2002 *Accomplishments*.

Drew upon outreach activities from the previous 4 years particularly the "local buildout" presentations to set up an email distribution list of city/town elected officials, town managers/executive secretaries, town/city planers, and city/town engineers, Departments of Public Works within the North Coastal Watersheds. Email list allows team leader to keep them appraised on grant opportunities, environmental news, programs, and employment opportunities.

Team leader is an attendee to meetings of the MAPC North Shore Task Force (NSTF), Great Marsh Summit Team, Rumney Marsh Task Force, North Suburban Planning Commission (NSPC), SSCW Technical Advisory Committee, Friends of Lake Quannapowitt (FOLQ), Eight Towns and the Bay, Saugus River Watershed Council, Saugus River Watershed Commission, Safer Waters in Massachusetts (SWIM) and Water Resource Commission (WRC).

Assisted Project Link a cooperative an educational effort of the Essex and Manchester School Districts in securing Volunteer Monitoring Grant funds.

Partnered with Massachusetts Community Water Watch Partnership

Education- through 58 presentations in Lynn, Salem, and Beverly--we educated 1200 students grades k-5.

Forum- we held a forum on Mercury at Salem State to raise awareness about the dangers it poses to the environment and human health. 90 students, professors and community members attended it.

Stenciling- we had a 2-storm drain stenciling events in the spring. The first was in Beverly at the end of March and we stenciled about 200 drains and got media coverage in the Salem Evening News and The Beverly Citizen. The second event was in Salem this past weekend and we stenciled about 250 drains and had City Councilor Chuber and Mayor Usovicz participated in the event. We developed a door hanger to educate the community about what we were doing.

Earth Day at Lynn Woods- held on 4/20.

Appendix F. Impaired Waters

This appendix presents the 2002 Integrated List of Waters for the North Coastal Watersheds. Waters listed in Category 5 constitute the 303(d) List and, as such, are reviewed and approved by the EPA. The remaining four categories are submitted in fulfillment of the requirements under § 305(b), essentially replacing the old 305(b) Report format.

Integrated list categories 1-3 include those waters that are either unimpaired or unassessed with respect to their support of designated uses. Often insufficient data and information exist to assess all designated uses of any particular waterbody or segment. Furthermore, no Massachusetts waters are listed in Category 1 because a statewide health advisory pertaining to the consumption of fish precludes any waters from being in full support of the fish consumption use. Waters listed in Category 2 were found to support the uses for which they were assessed, but other uses were unassessed. Finally, Category 3 contains those waters for which insufficient or no information was available to assess any uses. Waters for which assessments were determined to be insufficient for 303(d) listing were also included in Category 3. Waters exhibiting impairment for one or more uses are placed in either Category 4 (impaired but not requiring TMDLs) or Category 5 (impaired and requiring one or more TMDLs) according to the EPA guidance. Category 4 is further divided into three sub-categories – 4A, 4B and 4C – depending upon the reason that TMDLs are not needed. Category 4A includes waters for which the required TMDL(s) have already been completed and approved by the EPA. However, since segments can only appear in one category, waters that have an approved TMDL for some pollutants but not others remain in Category 5 until TMDLs are approved for all of the pollutants. [12]

Following is a summary list of water categories with the number of NCW waterbodies in each category, then the detailed list of each category of impaired waters in NCW.

?	Category 1	"Waters attaining all designated uses"	None in MA
?	Category 2	"Attaining some uses; other uses not assessed"	19 in NCW
?	Category 3	"No Uses Assessed"	10 in NCW
?	Category 4A	"TMDL is Completed"	None in NCW
?	Category 4B	"Waters expected to attain all designated uses in the near future"	None in NCW
?	Category 4C	"Impairment not caused by a pollutant"	6 in NCW
?	Category 5	"Waters requiring a TMDL"	47 in NCW

NCW Category 2 Waters - 2002

"Attaining some uses; other uses not assessed"
http://www.state.ma.us/dep/brp/wm/files/2002-il2.pdf - includes all categories listed below
(also available on http://www.northcoastal.net/ncw/Docs/2002-il2-Impaired_Waters_Integrated_List.pdf)

NAME / SEGMENT ID / DESCRIPTION / SIZE / ASSESS DATE / USES ATTAINED

? Babson Reservoir (93001) MA93001_2002 Gloucester 29 acres Oct-98 -Secondary Contact Recreation –Aesthetics

? Birch Pond (93004) MA93004_2002 Saugus/Lynn 80 acres Oct-98 -Secondary Contact Recreation -Aesthetics

? Breeds Pond (93006) MA93006_2002 Lynn 177 acres Oct-98 -Secondary Contact Recreation -Aesthetics

? Crane River Pond (93017) MA93017_2002 Danvers 18 acres Oct-98 -Secondary Contact Recreation -Aesthetics

? Fernwood Lake (93022) MA93022_2002 Gloucester 26 acres Oct-98 -Secondary Contact Recreation -Aesthetics

? Goose Cove Reservoir (93093) MA93093_2002 Gloucester 58 acres Oct-98 -Secondary Contact Recreation -Aesthetics

? Gravelly Pond (93028) MA93028_2002 Hamilton 46 acres Oct-98 -Secondary Contact Recreation -Aesthetics

[12] Massachusetts Year 2002 Integrated List of Waters, Part 2 – Final Listing of Individual Categories of Waters -- CN: 125.2, September 2003 -- available at http://www.state.ma.us/dep/brp/wm/files/2002-il2.pdf

- Haskell Pond (93031) MA93031_2002 Gloucester 48 acres Oct-98 -Secondary Contact Recreation -Aesthetics
- Mill Pond (93050) MA93050_2002 Gloucester 21 acres Oct-98 -Secondary Contact Recreation -Aesthetics
- Porters Pond (93058) MA93058_2002 Danvers 20 acres Oct-98 -Secondary Contact Recreation -Aesthetics
- Quarry Reservoir (93053) MA93053_2002 Rockport 5 acres Oct-98 -Secondary Contact Recreation -Aesthetics
- Round Pond (93063) MA93063_2002 Hamilton 37 acres Oct-98 -Secondary Contact Recreation -Aesthetics
- Rum Rock Lake (93064) MA93064_2002 Rockport 9 acres Oct-98 -Secondary Contact Recreation -Aesthetics
- Seaplane Basin (93067) MA93067_2002 Revere 53 acres Oct-98 -Secondary Contact Recreation -Aesthetics
- Spring Pond (93073) MA93073_2002 Peabody/Lynn/Salem 59 acres Oct-98 -Secondary Contact Recreation -Aesthetics
- Upper Pond (93083) MA93083_2002 Saugus 13 acres Oct-98 -Secondary Contact Recreation -Aesthetics
- Walden Pond (93084) MA93084_2002 Lynn/Saugus/Lynnfield 231 acres Oct-98 -Secondary Contact Recreation -Aesthetics
- Wallace Pond (93085) MA93085_2002 Gloucester 23 acres Oct-98 -Secondary Contact Recreation -Aesthetics
- Waters River Pond (93088) MA93088_2002 Danvers 57 acres Oct-98 -Secondary Contact Recreation -Aesthetics

NCW Category 3 Waters - 2002

"No Uses Assessed"

NAME / SEGMENT ID / DESCRIPTION / SIZE / REVIEW DATE

- Alewife Brook (9354875) MA93-26_2002 Headwaters just north of B&M Railroad, Rockport to inlet Babson Reservoir, Gloucester. Miles 1.0-0.0 1 miles Jan-99
- Bass River (9355175) MA93-07_2002 Headwaters west of Wenham Lake to the outlet of Shoe Pond north of Route 62, Beverly. 2.9 miles Feb-99
- Beck Pond (93003) MA93003_2002 Hamilton 40 acres Oct-98
- Browns Pond (93008) MA93008_2002 Peabody 25 acres Oct-98
- Buswell Pond (93009) MA93009_2002 Gloucester 7 acres Oct-98
- Crystal Lake (93018) MA93018_2002 Wakefield/Stoneham 80 acres Oct-98
- Niles Pond (93052) MA93052_2002 Gloucester 35 acres Oct-98
- Sluice Pond (93071) MA93071_2002 Lynn 39 acres Oct-98
- Spring Pond (93074) MA93074_2002 Peabody 10 acres Oct-98
- Unnamed Tributary (9354855) MA93-27_2002 Outlet Babson Reservoir, Gloucester to inlet Mill Pond, Gloucester. Miles 0.7-0.0 0.7 miles Jan-99

NCW Category 4c Waters - 2002

"Impairment not caused by a pollutant"

NAME / SEGMENT ID / DESCRIPTION / SIZE / ASSESS DATE / IMAPIRMENT CAUSE

- Cedar Pond (93013) MA93013_2002 Peabody 11 acres Oct-98 -(Exotic species*)
- Chebacco Lake (93014) MA93014_2002 Hamilton/Essex 204 acres Oct-98 -(Exotic species*)
- Days Pond (93092) MA93092_2002 Gloucester 1 acres Oct-98 -(Exotic species*)

- Griswold Pond (93029) MA93029_2002 Saugus 13 acres Oct-98 -(Exotic species*)
- Lower Pond (93044) MA93044_2002 Saugus 19 acres Oct-98 -(Exotic species*)
- Spring Pond (93072) MA93072_2002 Saugus 9 acres Oct-98 -(Exotic species*)

NCW Category 5 Waters - 2002

"Waters requiring a TMDL" (means the same thing as “303d listed” from previous years)

NAME / SEGMENT ID / DESCRIPTION / SIZE / ASSESS DATE / POLLUTANT NEEDING TMDL

- Annisquam River (9354825) MA93-12_2002 Gloucester Harbor to Ipswich Bay, Gloucester. 1.9 sq mi Jan-99 -Pathogens
- Bass River (9355175) MA93-08_2002 Outlet of Shoe Pond north of Route 62 to confluence with Danvers River, Beverley. 0.1 sq mi Feb-99 -Pathogens
- Beaver Brook (9355300) MA93-37_2002 Headwaters at wetland west of Dayton Street in Danvers to confluence with Crane River at Mill Pond in Danvers. 3.5 miles Apr-99 -Organic enrichment/Low DO -Pathogens
- Beaverdam Brook (9355700) MA93-30_2002 Headwaters west of Main Street, Lynnfield to confluence with Saugus River, Lynnfield. 2.5 miles Feb-99 -Organic enrichment/Low DO -Pathogens
- Beverly Harbor (93905) MA93-20_2002 0.78 sq mi Feb-99 -Pathogens
- Cape Pond (93011) MA93011_2002 Rockport 41 acres Oct-98 -Turbidity
- Cat Brook (9355050) MA93-29_2002 Headwaters north of Route 128 Manchester/Essex/Gloucester to confluence Manchester Harbor, Manchester. Miles 2.5-0.0 2.5 miles Feb-99 -pH -Siltation -Pathogens
- Coy Pond (93016) MA93016_2002 Wenham 25 acres Oct-98 -Noxious aquatic plants -Turbidity
- Crane Brook (9355325) MA93-02_2002 Headwaters west of Newburyport Turnpike (Route 95) to inlet Mill Pond, Danvers. 2.3 miles Apr-99 -Unionized Ammonia -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens -Suspended solids -Turbidity
- Crane River (9355275) MA93-38_2002 Outlet Mill Pond, Danvers to outlet of pump house sluiceway at Purchase Street, Danvers. 0.3 miles Apr-99 -Pathogens -Turbidity
- Crane River (9355275) MA93-41_2002 Outlet pump house sluiceway at Purchase Street, Danvers to confluence Danvers River, Danvers. 0.08 sq mi Apr-99 -Pathogens
- Danvers River (9355200) MA93-09_2002 Confluence with Porter, Crane and Waters rivers, Danvers to mouth at Beverly Harbor, Beverly/Salem. 0.5 sq mi Apr-99 -Pathogens
- Essex Bay (93901) MA93-16_2002 1.15 sq mi Jan-99 –Pathogens
- Essex River (9354625) MA93-11_2002 Source east of Southern Avenue to mouth at Essex Bay, Essex. 0.9 sq mi Jan-99 –Pathogens
- Flax Pond (93023) MA93023_2002 Lynn 48.9 acres Oct-98 -Noxious aquatic plants -Turbidity -(Exotic species*)
- Floating Bridge Pond (93024) MA93024_2002 Lynn 10.1 acres Oct-98 -Nutrients -Noxious aquatic plants -Turbidity
- Forest River (9355500) MA93-10_2002 Approximately 1/2 mile upstream of Loring Avenue, Salem to mouth at Salem Harbor, Salem/Marblehead. 0.05 sq mi Mar-99 -Organic enrichment/Low DO -(Flow alteration*) -(Other habitat alterations*) –Pathogens
- Frost Fish Brook (9355250) MA93-36_2002 Headwaters, southeast of Danvers locality of Putnamville to confluence Porter River just south of Route 62, Danvers. Miles 1.3-0.0 1.3 miles Jun-97 -Pathogens
- Gloucester Harbor (93903) MA93-18_2002 2.24 sq mi Feb-99 -Pathogens
- Goldthwaite Brook (9355450) MA93-05_2002 Outlet Cedar Pond to confluence with Proctor Brook, Peabody. 3.3 miles Mar-99 -Cause Unknown -Unknown toxicity -Unionized Ammonia -Nutrients -Organic enrichment/Low DO -(Flow alteration*) -(Other habitat alterations*) -Pathogens -Noxious aquatic plants
- Hawkes Brook (9355650) MA93-32_2002 Headwaters at the Lynn/Lynnfield border to the outlet of Hawkes Pond in North Saugus. 2.6 miles Mar-99 –Pathogens

- Hawkes Brook (9355650) MA93-33_2002 Outlet of Hawkes Pond, North Saugus to confluence with 1.1 miles Mar-99 -Pathogens
- Hawkes Pond (93032) MA93032_2002 Lynnfield 73 acres Oct-98 -Turbidity
- Lily Pond (93039) MA93039_2002 Gloucester 31 acres Oct-98 -Noxious aquatic plants -Turbidity
- Lynn Harbor (93909) MA93-23_2002 6.67 sq mi Feb-99 -Pathogens
- Manchester Harbor (93904) MA93-19_2002 0.29 sq mi Feb-99 -Pathogens
- Marblehead Harbor (93908) MA93-22_2002 0.56 sq mi Mar-99 -Pathogens
- Mill River (9354850) MA93-28_2002 Outlet Mill Pond, Gloucester to confluence with Annisquam River, Gloucester. 0.09 sq mi Jan-99 -Pathogens
- Mill River (9355675) MA93-31_2002 From headwaters in wetlands north of Salem Street in Wakefield to confluence with Saugus River, Wakefield. 2 miles Feb-99 -Organic enrichment/Low DO -Pathogens -Suspended solids -Turbidity
- Nahant Bay (93910) MA93-24_2002 5.27 sq mi Feb-99 -Pathogens
- North River (9355375) MA93-42_2002 Downstream of Route 114 bridge (Proctor Brook becomes North River at this bridge), Peabody to confluence with Danvers River, Salem. 0.2 sq mi Apr-99 -Unionized Ammonia -Organic enrichment/Low DO –Pathogens
- Pillings Pond (93056) MA93056_2002 Lynnfield 96 acres Oct-98 -Noxious aquatic plants -Turbidity
- Pines River (9355725) MA93-15_2002 Route 1, Revere/Saugus to mouth at Lynn Harbor, Saugus/Revere. 0.7 sq mi Mar-99 -Pathogens
- Porter River (9355225) MA93-04_2002 Confluence with Frost Fish Brook to confluence with Danvers River, Danvers. 0.1 sq mi Apr-99 -Siltation -Pathogens -Noxious aquatic plants -Turbidity
- Proctor Brook (9355400) MA93-39_2002 Outlet of small pond in wetland north of Downing Road, Peabody to Goodhue Street bridge, Salem. 2.9 miles Apr-99 -Cause Unknown -Nutrients -Siltation -(Other habitat alterations*) -Pathogens
- Proctor Brook (9355400) MA93-40_2002 Goodhue Street bridge, Salem to Route 114 culvert, Salem. 0.01 sq mi Apr-99 -Pathogens
- Lake Quannapowitt (93060) MA93060_2002 Wakefield 250 acres Oct-98 -Noxious aquatic plants -Turbidity -(Exotic species*)
- Rockport Harbor (93902) MA93-17_2002 0.02 sq mi Feb-99 -Pathogens
- Salem Harbor (93906) MA93-21_2002 1.62 sq mi Mar-99 -Pathogens
- Salem Sound (93907) MA93-25_2002 10.01 sq mi Feb-99 -Pathogens
- Saugus River (9355550) MA93-14_2002 Saugus Iron Works, Saugus, to the mouth at Lynn Harbor, Lynn/Salem. 0.8 sq mi Feb-99 -Thermal modifications -(Flow alteration*) -Pathogens -Oil and grease
- Saugus River (9355550) MA93-34_2002 Source, outlet of Lake Quannapowitt, Wakefield to canal which discharges to Hawkes Pond, Wakefield/Lynnfield. 3.1 miles Mar-99 -Nutrients -(Flow alteration*) -(Other habitat alterations*) -Pathogens -Noxious aquatic plants -Turbidity
- Saugus River (9355550) MA93-35_2002 Canal which discharges into Hawkes Pond, Wakefield/Lynnfield to Saugus Iron Works, Saugus. 5.3 miles Mar-99 -Organic enrichment/Low DO -(Flow alteration*) -(Other habitat alterations*) -Pathogens
- Shoe Pond (93068) MA93068_2002 Beverly 8 acres Oct-98 -Turbidity
- Strangman Pond (93076) MA93076_2002 Gloucester 3 acres Oct-98 -Noxious aquatic plants -Turbidity
- Upper Banjo Pond (93080) MA93080_2002 Gloucester 11 acres Oct-98 -Noxious aquatic plants -Turbidity
- Waters River (9355350) MA93-01_2002 Headwaters north of Route 114, Peabody, to confluence with Danvers River, Danvers. 0.08 sq mi Apr-99 -(Other habitat alterations*) -Pathogens
- West Pond (93089) MA93089_2002 Gloucester 7 acres Dec-93 -Nutrients -Noxious aquatic plants

North Coastal 303d list - 1998

Beck Pond (93003)
MA93003 Hamilton
2200 Noxious aquatic plants

Browns Pond (93008)
MA93008 Peabody
2200 Noxious aquatic plants

Flax Pond (93023)
MA93023 Lynn
2200 Noxious aquatic plants

Floating Bridge Pond (93024)
MA93024 Lynn
0900 Nutrients
2200 Noxious aquatic plants

Lake Quannapowitt (93060)
MA93060 Wakefield
2200 Noxious aquatic plants

West Pond (93089)
MA93089 Gloucester
0900 Nutrients
2200 Noxious aquatic plants

Essex River (9354625)
MA93-11 Source to mouth at Essex Bay.
1700 Pathogens

Annisquam River (9354825)
MA93-12 Source to mouth at Ipswich Bay.
1700 Pathogens

Danvers River (9355200)
MA93-09 Confluence with Porter, Crane and Waters rivers to mouth at Beverly Harbor.
1700 Pathogens

Crane River (9355275)
MA93-03 Outlet Mill Pond to confluence Danvers River, Danvers.
1700 Pathogens

Waters River (9355350)
MA93-01 Headwaters to confluence with Danvers River, Danvers.
1700 Pathogens

North River (9355375)
MA93-06 Confluence with Goldthwaite and Proctor brooks to confluence with Danvers River, Salem.
0600 Unionized Ammonia
1200 Organic enrichment/Low DO
1700 Pathogens

Goldthwaite Brook (9355450)
MA93-05 Outlet Cedar Pond to confluence North River, Peabody.
0600 Unionized Ammonia
0900 Nutrients
1200 Organic enrichment/Low DO
1700 Pathogens

Forest River (9355500)
MA93-10 From milepoint 0.5 to West Shore Drive, Salem. Miles 0.5-0.0
1200 Organic enrichment/Low DO
1700 Pathogens

Essex Bay (93901)
MA93-16
1700 Pathogens

Rockport Harbor (93902)
MA93-17
1700 Pathogens

Gloucester Harbor (93903)
MA93-18
1700 Pathogens

Manchester Harbor (93904)

MA93-19
1700 Pathogens

Salem Harbor (93906)
MA93-21
1700 Pathogens

Marblehead Harbor (93908)
MA93-22
1700 Pathogens

Nahant Bay (93910)
MA93-24
1700 Pathogens

1998 303d Segments Needing Confirmation Watershed: North Coastal (93)

Coy Pond (93016)
MA93016 Wenham
2200 Noxious aquatic plants

Pillings Pond (93056)
MA93056 Lynnfield
2200 Noxious aquatic plants

Crane Brook (9355325)
MA93-02 Headwaters to Mill Pond, Danvers.
0600 Unionized Ammonia
1700 Pathogens

Saugus River (9355550)
MA93-13 Source to Saugus Iron Works.
1700 Pathogens

North Coastal 303d list 1996:

Essex River (Class SA/ORW)

Segment MA93-11: headwaters to mouth at Essex Bay. (0.90 square miles): Shellfishing Non-Support due to pathogens, low DO (4.8 mg/l) also below standards.

Annisquam River (SA)

Segment MA93-12: Source to mouth at Ipswich Bay. (1.90 square miles): Shellfishing and primary contact recreational uses impaired due to pathogens--(onsite septic systems confirmed as a source(s) in 1994.

Bass River (B/WWF)

Segment MA93-07: Headwaters to inlet Shoe Pond, Beverly. (2.4 river miles): Data dated (1987), pathogens (limited data, max 8000cfu/100ml) and low dissolved oxygen in upper end of segment (3.1 & 3.3 mg/l) impair primary contact and aquatic life use support.

Bass River (SB)

Segment MA93-08: Inlet Shoe Pond to confluence with Danvers River (0.10 square miles): 1987 data pathogens impair primary contact recreation, shellfishing area has been closed.

Danvers River (SB)

Segment MA93-09: From the confluence with Porter, Crane and Waters Rivers to mouth at Beverly Harbor (0.5 square miles): Data is old; fecal coliform levels impair primary contact recreational and shellfishing uses, CSOs are a problem. Elevated concentrations of heavy metals (Cr, Pb, Zn, Hg, As) and some PAHs in sediment also documented.

Porter River (SB)

Segment MA93-04: Confluence with Frost Fish Brook to confluence with Danvers River, Danvers. (0.10 square miles): Data is old; fecal coliform levels impair primary contact recreational and shellfishing is prohibited. Elevated metals (Cr, Pb, and As) and PAHs in sediment, no known source.

Crane Brook (B/WWF)

Segment MA93-02: Headwaters to Mill Pond, Danvers (2.30 river miles). Fecal coliform levels impair primary contact recreation, ammonia 1.1 & 1.2 mg/l impairs aquatic life use.

Crane River (SB)

Segment MA93-03: Outlet Mill Pond to confluence with the Danvers River, Danvers (0.08 square miles): Pathogens impair primary contact recreational use, shellfishing is prohibited. Metals and PAHs moderately high in sediment.

Waters River (SB)

Segment MA93-01: Headwaters to confluence with Danvers River (0.08 square miles): fecal coliform levels impair primary contact recreation use, shellfishing is prohibited. Metals and PAHs low in sediment.

North River (SB)

Segment MA93-06: Confluence with Goldthwaite and Proctor Brooks to confluence with Danvers River, Salem (0.20 square miles): pathogens impair primary and secondary contact recreation, shellfishing is prohibited, low dissolved oxygen and high concentrations of ammonia-nitrogen impair aquatic life use. Sediment has high concentrations of heavy metals (Cr, Pb, Zn, Cd, and As) and PAHs.

Goldthwaite Brook (B/WWF)

Segment MA93-05: Outlet Cedar Pond to confluence with the North River, Peabody (3.30 river miles): pathogens impair primary contact recreation, low dissolved oxygen, elevated TP and high ammonia-nitrogen concentrations impair aquatic life use. Eastman Gelatin instream toxicity testing data (required by NPDES permit # MA0003956) 1995/1996 data indicates acute instream toxicity due to storm water, slight effects due to dry weather discharges, and no adverse impacts to C. dubia at the upstream sampling station.

Forest River (SB)

Segment MA93-10: From mile point 0.5 to West Shore Drive, Salem (0.05 square miles): pathogens impair primary contact recreation, shellfishing prohibited, low dissolved oxygen (below 5.0 mg/l) impairs aquatic life use. Sediments found to contain high Pb and Cr and low/moderate concentrations of PAHs.

Saugus River (SB/ORW)

Segment MA93-14: Saugus Iron Works to the mouth at Lynn Harbor (0.80 square miles): pathogens impair primary and secondary contact recreation, shellfishing prohibited. Low dissolved oxygen (<4.0 mg/l) and ammonia-nitrogen (0.25 mg/l) impair aquatic life use. High levels of Zn in sediment. CSO Facilities Plan in development.

Pines River (SB/ORW)

Segment MA93-15: Route 1 Revere/Saugus to confluence with the Saugus River (0.7 square miles): Conditional restriction of shellfishing in several areas. Source differentiation study needed to identify specific sources of pathogens.

Essex Bay (SA)

Segment MA93-16: 1.15 square miles. Shellfishing conditionally approved, NERO has enforcement action for town of Essex regarding sewering issues related to bacterial loading.

Rockport Harbor (SB)

Segment MA93-17: 0.02 square miles. Pathogens impair shellfishing use--based on DMF status. Possible sources listed as on-site sewage disposal and marinas.

Gloucester Harbor (SB)

Segment MA93-18: 2.24 square miles. Pathogens impair primary contact recreation and shellfishing use. POTW discharge has been moved out of harbor. Gloucester consulting reports should be reviewed to determine need for additional work. CSO Facility Plan in development.

Manchester Harbor (SB)

Segment MA93-19: 0.29 square miles. Pathogens impair shellfishing use. NPDES discharge Manchester POTW.

Beverly Harbor (SB)

Segment MA93-20: 0.78 square miles. Pathogens impair primary contact, DMF does not list harbor for shellfish management area therefore not assessed as a use.

Salem Harbor (SB)

Segment MA93-21: 1.62 square miles. Pathogens impair shellfishing use. SESD effluent chronically toxic (see attached TOXTD summary). Initial TRE/TIE results indicate ammonia as primary toxicant (notes from 1992)--this information needs to be updated. SESD effluent scheduled to go on-line with secondary treatment in June 1996. Needs follow-up status/information.

Salem Sound (SB)

Segment MA93-25: 10.01 square miles. Pathogens impair primary recreational use and shellfishing use. Violations of dissolved oxygen standards measured but infrequent, ammonia-nitrogen exceeds 0.25 mg/l at SS01 & SS02 sampling stations. Source differentiation study recommended to identify source(s) of pathogen contamination.

Marblehead Harbor (SA)

Segment MA93-22: 0.56 square miles. Shellfishing is prohibited due to pathogens. Marinas listed as a possible source.

Lynn Harbor (SB)

Segment MA93-23: 6.67 square miles. Pathogens impair primary contact recreation and shellfishing is prohibited. Suspended solids and nutrients occasionally high impairing aesthetics, low dissolved oxygen and ammonia-nitrogen >0.25 mg/l impair aquatic life use. Lynn POTW (6:1 dilution available) meeting acute and chronic toxicity limits since 1993 (see attached TOXTD summary).

Nahant Bay (SA)

Segment MA93-24: 5.27 square miles. Pathogens impair primary recreation and shellfishing uses.

Beck Pond, (93003)

Hamilton: Pollutants/Stressors Noxious aquatic plants

Browns Pond, (93008)

Peabody: Pollutants/Stressors 2200 Noxious aquatic plants

Chebacco Lake, Coy Pond, (93016)

Wenham: Pollutants/Stressors Noxious aquatic plants

Flax Pond, (93023)

Lynn: Pollutants/Stressors Noxious aquatic plants DF study completed mid 80's City of Lynn Water and Sewer District has expressed interest in restoring anadromous fish run

Floating Bridge, (93024)

Pollutants/Stressors Nutrients Noxious aquatic plants

Griswold Pond, Lower Pond, Pillings Pond, (93056)

Lynnfield: Pollutants/Stressors Noxious aquatic plants

Lake Quannapowitt, (93060)

Wakefield: High Priority Pollutants/Stressors Nutrients Noxious aquatic plants DF study completed 1985 by CDM Friends of Lake Quannapowitt have been collecting water quality data and flow information For a number of years contact Doug Heath 617 918 1585

Sluice Pond, Spring Pond, West Pond (93089)

Gloucester: Pollutants/Stressors Nutrients Noxious aquatic plants Dam is under private ownership and in severe state of disrepair per DCR (DEM) dam safety program During recent rains flood waters crested dam City, owner and DCR (DEM) have been in a protracted dispute to resolve issues of breaching and or maintenance contact Scott Ryan for details 508 792 7716 x 118.

Appendix G: Funding Sources

The first list comprises grant funding sources for watershed projects. Generally, each funding source is available at only one time per annual cycle. The list below is a reference source for finding grants and then preparing to meet their annual submission deadline. Some of the listings below are the actual RFRs that were publicized at the time of this writing.

Following the list of funding sources is a list of previously funded projects within the NCW watershed. They were funded when the NCW Team had the authority to recommend Roundtable Projects to EOEA, which funding mechanism is no longer directly available. The list is provided to indicate the type of project that might be successfully funded.

Funding Sources for Watershed Projects

Program Name	Overview	FY 2004 Funding
Assessment and Watershed Protection Program Grants (AWPPGs)	The AWPPGs provide States and local governments, Federally recognized Indian Tribes, territories and possessions of the U.S., including the District of Columbia, interstate associations or intertribal consortia, public or private nonprofit, nongovernmental institutions and individuals (hereafter referred to as eligible applicants) an opportunity to carry out projects to develop and refine comprehensive watershed programs. The projects that eligible applicants can undertake to develop and refine their comprehensive watershed programs are diverse. In the past, award recipients have pursued a wide range of activities, such as developing management tools, advancing scientific and technical tools for protecting watershed health, improving availability of data and information about watersheds, and training watershed managers and the public about watershed management. EPA-GRANTS-051304-002 Project Officer, Phone 202-566-1206	$900,000
Bring Back the Natives Grant Program	This National Fish and Wildlife Foundation (NFWF) program provides funds to restore damaged or degraded riverine habitats and their native aquatic species through watershed restoration and improved land management. Successful projects will support the applied ecosystem strategy and address any or all of the following: (1) revised land management practices to eliminate causes of habitat degradation; (2) multiple species benefits, (3) direct benefits to native fish and aquatic community resources in watersheds with land managed by BLM, BOR, or FS; (4) multiple resource management objectives, (5) multiple project partners and innovative partnerships; (6) where appropriate, demonstration of a landscape ecosystem approach; and (7) innovative projects that develop new technology that can be shared with others.	$ 1, 050,000
Brownfields Job Training and Development Demonstration Pilots	EPA's brownfield program helps communities clean up and redevelop properties. EPA defines a brownfield site as "real property, the expansion, redevelopment, or reuse of which may be contaminated by the presence or potential presence of a hazardous substance, pollutant, or contaminant." The program helps mitigate potential health risks and assists in restoring economic vitality to areas where brownfields exist. The objectives of the Brownfields Job Training Grants are to prepare trainees for future employment in the environmental field and facilitate the clean up of brownfields sites. The grant recipients must prepare trainees in activities that can be usefully applied to a clean up.	$ 2 Million

Bureau of Resource Protection (BRP)	BRP Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation: Program Guide describing the BRP Grant Programs revised for FY2003. DEP's grant and loan programs consist of federal funds from the U.S. EPA as authorized by the Clean Water Act, Section 604 b, 104b3 and 319; and the Drinking Water State Revolving Fund DWSRF Set asides. Other programs are derived through state appropriation. Updated November 2002. http://mass.gov/dep/brp/mf/files/glprgm.pdf	Information Source
Catalog of Federal Funding Sources for Watershed Protection	The Catalog of Federal Funding Sources for Watershed Protection Web site is a searchable database of financial assistance sources (grants, loans, cost-sharing) available to fund a variety of watershed protection projects. To select funding programs for particular requirements, use either of two searches below. One is based on subject matter criteria, and the other is based on words in the title of the funding program. Criteria searches include the type of organization (e.g., non-profit groups, private landowner, state, business), type of assistance sought (grants or loans), and keywords (e.g., agriculture, wildlife habitat). Searches result in a listing of programs by name. Click on each program name to review detailed information on the funding source. http://cfpub1.epa.gov/fedfund/ and http://cfpub1.epa.gov/fedfund/othersources.cfm	Information Source
Clean Water State Revolving Fund (CWSRF)	This MA-DEP program assists cities, towns, and wastewater districts in the financing of water pollution abatement projects, including nonpoint source projects. The financial assistance takes the form of subsidized loans at a 2% interest rate to borrowers. Details at http://mass.gov/dep/brp/mf/cwsrf.htm	$200 - $300 million per year
Coastal Program	The U.S. Fish and Wildlife Service (FWS) Coastal Program works to conserve healthy coastal habitats on public or private land for the benefit of fish, wildlife, and people in 16 specific coastal areas. The program forms cooperative partnerships designed to (1) protect costal habitats through conservation easements and acquisitions; (2) restore coastal wetlands, uplands, and riparian areas; and (3) remove barriers to fish passage in coastal watersheds and estuaries. Program biologists provide restoration expertise and financial assistance to federal and state agencies, local and tribal governments, businesses, private landowners, and conservation organizations such as local land trusts and watershed councils.	$10 million
Community Septic Management Program (CSMP)	Analysis of Homeowner Septic Repair Special Revenue Account: This form can be used by Commonwealth communities participating in the Community Septic Management Program (CSMP) Title 5 betterment loans, for their quarterly reporting requirements. Form DA91 http://mass.gov/dep/brp/mf/files/dmsda91.doc	Part of CWSRF

Coastal Services Center Cooperative Agreements	The National Oceanic and Atmospheric Administration (NOAA) guides the conservation and management of coastal resources through a variety of mechanisms, including collaboration with the coastal resource management programs of the nation's states and territories. The mission of the NOAA Coastal Services Center (CSC) is to support the environmental, social, and economic well being of the coast by linking people, information, and technology. The vision of the NOAA Coastal Services Center is to be the most useful government organization to those who manage and care for our nation's coasts. In FY04, CSC will support activities in the following areas: Landscape Characterization and Restoration, GIS Integration and Development, Coastal Remote Sensing, Information Resources, Pacific Services Center, and Integrated Ocean Observing Systems. Eligible applicants are institutions of higher education, hospitals, other non-profits, commercial organizations, foreign governments, organizations under the jurisdiction of foreign governments, international organizations, and state, local and Indian tribal governments.	$ 3 million
Coastal Zone Management Administration/ Implementation Awards	This program assists states in implementing and enhancing Coastal Zone Management (CZM) programs that have been approved by the Secretary of Commerce. Funds are available for projects in areas such as coastal wetlands management and protection, natural hazards management, public access improvements, reduction of marine debris, assessment of impacts of coastal growth and development, special area management planning, regional management issues, and demonstration projects with potential to improve coastal zone management.	$79,700,000
Community Development Block Grant Program	The Department of Housing and Urban Development sponsors this program, intended to develop viable communities by providing decent housing and a suitable living environment and by expanding economic opportunities primarily for persons of low and moderate income. Recipients may initiate activities directed toward neighborhood revitalization, economic development, and provision of improved community facilities and services. Specific activities may include public services, acquisition of real property, relocation and demolition, rehabilitation of structures, and provision of public facilities and improvements, such as new or improved water and sewer facilities.	$4,330,846
Community-based Restoration Program	The NOAA Community-based Restoration Program (CRP) provides funds for small-scale, locally driven habitat restoration projects that foster natural resource stewardship within communities. The program seeks to bring together diverse partners to implement habitat restoration projects to benefit living marine resources. Projects might include restoring salt marshes, mangroves, and other coastal habitats; improving fish passage and habitat quality for anadromous species; restoring and creating oyster reefs, removing exotic vegetation and replanting with native species; removing dams; and similar projects to restore habitat or improve habitat quality for populations of marine and anadromous fish. Partnerships are sought at the national and local level to contribute funding, land, technical assistance, workforce support, or other in-kind services.	$10,000,000

Conservation Innovation Grants	The USDA Natural Resources Conservation Service is soliciting applications for financial assistance for fiscal year 2004 Conservation Innovation Grants (CIG). Funds for single- or multi-year projects, not to exceed three years, will be awarded through a nationwide competitive grants process. CIG competitions will emphasize projects that have a goal of providing benefits over a large geographic area. These projects may be watershed-based, regional, multi-State, or nationwide in scope. Applications should describe the use of innovative technologies or approaches, or both, to address a natural resource conservation concern or concerns. The natural resource concerns eligible for funding through CIG are identified in the Request for Proposals. CIG is not a research program. Instead, it is a vehicle to stimulate the adoption of conservation approaches or technologies that have been studied sufficiently to indicate a likelihood of success, and are likely candidates for eventual technology transfer. CIG will fund projects targeting innovative on-the-ground conservation, including pilot projects and field demonstrations. Natural Resources Specialist, Phone 301.504.2222, Email cig@usda.gov	$15,000,000
Cooperative Endangered Species Conservation Fund	The U.S. Fish and Wildlife Service's (USFWS) Cooperative Endangered Species Conservation Fund provides financial assistance to states and territories that have entered into cooperative agreements with the USFWS to assist in the development of programs for the conservation of endangered and threatened species. The assistance provided to the state or territorial wildlife agency can include animal, plant, and habitat surveys; research; planning; monitoring; habitat protection, restoration, management, and acquisition; and public education. The Fund is dispersed to the states and territories through four programs: Conservation Grants, Habitat Conservation Planning Assistance Grants, Habitat Conservation Plan Land Acquisition Grants, and Recovery Land Acquisition Grants. Although not directly eligible for these grants, third parties such as nonprofit organizations and local governments may work with their state or territorial wildlife agency to apply for these funds.	$81,596,000
Coastal Nonpoint Source Pollution Grant Program	CZM will issue a Request for Response (RFR) for the Coastal Nonpoint Source Pollution (CNPS) grant program in September of 2004. Grants issued under the CNPS Grant Program, as well as the Coastal Pollutant Remediation Grant Program (CPR), serve to implement portions of the Massachusetts Coastal Nonpoint Source Control Plan. The Plan includes measures to address nonpoint source pollution problems from each of the following sources: urban areas, marinas and recreational boating, agriculture, forestry, hydromodification (alteration of hydrologic characteristics of coastal and noncoastal waters), wetlands, and riparian areas. The primary goal of both of these grant programs is to improve coastal water quality by reducing or eliminating nonpoint sources of pollution through measures and strategies consistent with the Coastal Nonpoint Source Control Program. http://www.mass.gov/czm/fy05cnpsearlynotice.pdf	Part of CWSRF
Community Development Planning Program (EOEA and	Executive Order 418 Community Development Planning Program -- Up to $30,000 per grant, to fund growth planning services used to create a Community Development Plan that addresses housing, transportation, economic development and natural resources. Municipalities Jointly funded and administered by EOEA, the Department of Housing and Community Development (DHCD), and the Massachusetts Highway Department (MHD) http://www.mass.gov/czm/environmentalgrants.pdf	Information Source

Cooperative Forestry Assistance Programs	Through its Forest Legacy Program (FLP), the USDA Forest Service supports state efforts to protect environmentally sensitive forest lands. Designed to encourage the protection of privately owned forest lands, FLP is an entirely voluntary program. The program helps fund the acquisition of forest land or partial interests in privately owned forest lands. It encourages and supports the acquisition of conservation easements, legally binding agreements transferring a negotiated set of property rights from one party to another, without removing the property from private ownership or the local tax rolls. FLP conservation easements restrict development, require sustainable forestry practices, protect a range of public vales, and sometimes require public access for recreation.	$64,000,000
Diesel Retrofit Program (MDRP)	The Massachusetts Diesel Retrofit Program (MDRP) responds to the need to control air pollution emissions from diesel engine equipment on construction sites. Currently, most construction equipment, including backhoes, front-end loaders, cranes, and air compressors are not required to be fitted with after-engine emission controls. However, diesel engines emit high levels of nitrogen oxides, particulate matter (PM), and a complex mixture of toxic gases. Many of the gases are known or suspected cancer-causing agents. The goal of the MDRP is to help reduce adverse health impacts, such as asthma, shortness of breath and decreased lung capacity, along with citizen complaints relating to emissions from diesel engines. http://mass.gov/dep/brp/mf/files/diesel.pdf	Part of CWSRF
Drinking Water State Revolving Fund	EPA awards grants to states to capitalize their Drinking Water State Revolving Fund (DWSRF) programs. States use a portion of their capitalization grants to set up a revolving fund from which loans are provided to eligible public water utilities (publicly- and privately-owned) to finance the costs of infrastructure projects. States rank projects and offer loans to utilities based on a priority ranking system. Priority is given to eligible projects that: (1) address the most serious risk to human health; (2) are necessary to ensure compliance with the requirements of the Safe Drinking Water Act; and, (3) assist systems most in need, on a per household basis, according to state-determined affordability criteria. States may also use up to 31 percent of their capitalization grants to fund set-aside activities that help to prevent contamination problems of surface and ground water drinking water supplies, as well as enhance water system management through source water protection, capacity development, and operator certification programs.	$844,985,000
Environmental Entrepreneurship Program (EEP)	The National Oceanic and Atmospheric Administration Educational Partnership Program with Minority Serving Institutions (EPP/MSI) is designed to strengthen the capacity of Minority Serving Institutions to foster student careers, entrepreneurship opportunities and advanced academic degrees in sciences directly related to NOAA's mission. The Environmental Entrepreneurship Program is designed to support education and training programs that engage students in applying the necessary skills, tools, methods and technologies in sciences directly related to NOAA's mission. This includes fostering educational opportunities in coastal, oceanic, atmospheric, environmental sciences, and remote sensing technology coupled with training in economics, marketing, product development, and services to create jobs, businesses and economic development opportunities. The Environmental Entrepreneurship Program promotes partnerships with MSIs, NOAA and the public-private sector. Policy Advisor, Phone 301-713-0942 x122, Fax 301-713-0947, Email Steve.J.Drescher@noaa.gov	$3,000,000

Environmental Justice Collaborative Problem-Solving Grant Program	In 2003, the Office of Environmental Justice (OEJ) initiated the first Environmental Justice Collaborative Problem-Solving (CPS) Grant Program. The purpose of the program is to provide financial assistance to affected local community-based organizations who wish to engage in constructive and collaborative problem-solving by utilizing tools developed by EPA and others to find viable solutions for their community's environmental and/or public health concerns.	$ 3 million; (grants awards of $100,000 each)
Environmental Justice Hazardous Substance Small Grants Program	The purpose of this grant program is to provide financial assistance to affected local community-based organizations to support projects to examine issues related to a community's exposure to multiple environmental harms and risks. Projects must be of a research nature only, i.e., survey, research, collecting and analyzing data which will be used to expand scientific knowledge or understanding of the subject studied. The EPA has interpreted 'research' to include studies that extend to socioeconomic, institutional, and public policy issues as well as the 'natural' sciences. Research projects need not be limited to academic studies. EPA intends for the results of these research projects to be disseminated to members of the affected community. Funds can be used to develop a new activity or substantially improve the quality of existing programs that have a direct impact on affected communities.	$500,000
Environmental Quality Incentives Program	The USDA Natural Resources Conservation Service's Environmental Quality Incentives Program (EQIP) was established to provide a voluntary conservation program for farmers and ranchers to address significant natural resource needs and objectives. Nationally, it provides technical, financial, and educational assistance; sixty percent of it is targeted to livestock-related natural resource concerns and the rest to more general conservation priorities. EQIP is available primarily in nationwide where there are significant natural resource concerns and objectives.	$832,000,000
EPA Funding and Grants website	Website lists numerous environmental funding and grant sources in the following categories: General References, Wastewater and Drinking Water, Water Quality http://www.epa.gov/water/funding.html	Information Source
Five-Star Restoration Program	The EPA supports the Five-Star Restoration Program by providing funds to the National Fish and Wildlife Foundation and its partners, the National Association of Counties, NOAA's Community-based Restoration Program and the Wildlife Habitat Council. These groups then make subgrants to support community-based wetland and riparian restoration projects. Competitive projects will have a strong on-the-ground habitat restoration component that provides long-term ecological, educational, and/or socioeconomic benefits to the people and their community. Preference will be given to projects that are part of a larger watershed or community stewardship effort and include a description of long-term management activities. Projects must involve contributions from multiple and diverse partners, including citizen volunteer organizations, corporations, private landowners, local conservation organizations, youth groups, charitable foundations, and other federal, state, and tribal agencies and local governments. Each project would ideally involve at least five partners who are expected to contribute funding, land, technical assistance, workforce support, or other in-kind services that are equivalent to the federal contribution.	$500,000

Flood Mitigation Assistance Program	The Flood Mitigation Assistance (FMA) program helps states and communities identify and implement measures to reduce or eliminate the long-term risk of flood damage to homes and other structures insurable under the National Flood Insurance Program (NFIP). Projects may include (1) elevation, relocation, or demolition of insured structures; (2) acquisition of insured structures and property; (3) minor, localized structural projects that are not fundable by state or other federal programs (erosion-control and drainage improvements); and (4) beach nourishment activities such as planting of dune grass.	Not yet available
Freshwater Mussel Fund	The National Fish and Wildlife Foundation and the U.S. Fish and Wildlife Service are administering a fund to enhance and protect freshwater mussel resources. Funds are available for the enhancement and protection of the mussel resource and for the restoration and cultivation of mussel shell populations allegedly affected by illegal acts.	Not yet available
Hazard Mitigation Grant Program	The Federal Emergency Management Agency's Hazard Mitigation Grant Program (HMGP) aims to provide States and communities with resources to invest in long-term actions that help to reduce the toll from potential natural and manmade hazards. The program also supports the implementation of mitigation measures during the immediate recovery from a disaster. The HMGP funds projects to protect either public or private property, as long as the project fits within the State's and local government's overall mitigation strategy and complies with program guidelines. In response to flood hazards, eligible projects include the elevation, relocation or acquisition and demolition of flood-prone structures, stormwater management projects, and certain types of minor flood control projects. The State is responsible for setting priorities for funding and administering the HMGP. Eligible applicants must apply for the program through the State. Individuals, businesses, or other organizations should contact their State Hazard Mitigation Officer and local government official for specific details.	Not yet available
Integrated Research, Education, and Extension Competitive Grants Program	Conservation Effects Assessment Project: The Cooperative State Research, Education, and Extension Service and Natural Resources Conservation Service are seeking applications proposing to evaluate the effects of watershed conservation practices, with a focus on understanding how the suite of conservation practices, the timing of these activities, and the spatial distribution of these practices throughout a watershed influence their effectiveness for achieving locally defined water quality goals. Email webmaster@csrees.usda.gov	$2,700,000
Landowner Incentive Program (Non-Tribal)	The U.S. Fish and Wildlife Service's Landowner Incentive Program (LIP) grant program provides competitive matching grants to states, territories, and the District of Columbia to establish or supplement landowner incentive programs. These programs provide technical and financial assistance to private landowners for projects that protect and restore habitats of listed species or species determined to be at-risk. LIP projects will likely involve activities such as the restoration of marginal farmlands to wetlands, the removal of exotic plants to restore natural prairies, a change in grazing practices and fencing to enhance important riparian habitats, instream structural improvements to benefit aquatic species, road closures to protect habitats and reduce harassment of wildlife, and acquisition of conservation easements. Although not directly eligible for these grants, third parties such as nonprofit organizations may benefit from these funds by working directly with their states to see if either grants or partnering opportunities are available.	$25.8 million

Massachusetts Environmental Trust	The Massachusetts Environmental Trust is the state's largest philanthropy funding water quality initiatives. Our goals are to improve and safeguard the quality of the waterways throughout the Commonwealth. We fund nonprofit organizations, municipalities, scientists and educational institutions through two programs: Unrestricted General Grants and Restricted Settlement Grants http://www.agmconnect.org/massenvironmentaltrust/grant-seekers-existing-grantees.htm	Information Source
Migratory Bird Conservancy	The National Fish and Wildlife Foundation's (NFWF) Migratory Bird Conservancy (MBC) program is a bird conservation grant fund supported by donations from birding businesses and their customers, and matched by NFWF. The MBC will fund projects that directly address conservation of priority bird habitats in the Western Hemisphere. Acquisition, restoration, and improved management of habitats are program priorities. Education, research, and monitoring will be considered only as components of actual habitat conservation projects.	Not available
National Fish and Wildlife Foundation General Matching Grants	The National Fish and Wildlife Foundation operates a conservation grants program that awards challenge grants, on a competitive basis, to eligible grant recipients. Grants are awarded to projects that: (1) address priority actions promoting fish and wildlife conservation and the habitats on which they depend; (2) work proactively to involve other conservation and community interests; (3) leverage available funding; and (4) evaluate project outcomes.	$4,000,000
National Wildlife Refuge Friends Group Grant Program	The National Fish and Wildlife Foundation provides grants for projects that help organizations to be effective co-stewards of our Nation's important natural resources within the National Wildlife Refuge System. This program provides competitive seed grants to help increase the number and effectiveness of organizations interested in assisting the refuge system nationwide. The program will fund: (1) Start-up Grants to assist starting refuge support groups with formative and/or initial operational support (membership drives, training, postage, etc.); (2) Capacity Building Grants to strengthen existing refuge support groups' capacity to be more effective (outreach efforts, strategic planning, membership development); and (3) Project Specific Grants to support a specific project (conservation education programs for local schools, outreach programs for private landowners, habitat restoration projects, etc.)	$200,000
Native Plant Conservation Initiative	The National Fish and Wildlife Foundation's Native Plant Conservation Initiative (NPCI) supports on-the-ground conservation projects that protect, enhance, and/or restore native plant communities on public and private land. Projects typically fall into one of three categories and may contain elements of each: protection and restoration, information and education, and inventory and assessment. Applicants are encouraged, when appropriate, to include a pollinator component in their project. The Bureau of Land Management, Forest Service, Fish and Wildlife Service, and National Park Service fund this program.	Not yet available
Nonpoint Source Implementation Grants (319 Program)	Through its 319 program, EPA provides formula grants to the states and tribes to implement nonpoint source projects and programs in accordance with section 319 of the Clean Water Act (CWA). Nonpoint source pollution reduction projects can be used to protect source water areas and the general quality of water resources in a watershed. Examples of previously funded projects include installation of best management practices (BMPs) for animal waste; design and implementation of BMP systems for stream, lake, and estuary watersheds; basinwide landowner education programs; and lake projects previously funded under the CWA section 314 Clean Lakes Program.	$237,092,900

Nonpoint Source Management Plan (MA-DEP - Volume I - Strategic Summary 2000)	Since, by definition, nonpoint source pollution is "pollution of surface water or groundwater supplies originating from land-use activities and or the atmosphere", a key element of preserving and cleaning up our impaired waters across the Commonwealth will be contingent upon our local communities ability to effectively manage future growth and development. Section VII of the Manual provides two funding tables of available funding resources to assist local officials and community stakeholders. The first table highlights specific programs available for addressing nonpoint sources of pollution, along with a corresponding "Reference #" which provides specific program and contact information. The second table provides a listing of community funding resources available for managing local growth and development, while preserving and protecting our natural resources. In addition, a broad range of technical assistance resources is provided to assist communities in resource protection and community planning and development. http://www.mass.gov/dep/brp/wm/files/npsmpv1.doc	Information Source
Northeast Utilities Environmental Community Grant Program	Grants between $250 and $1,000 are awarded twice a year – in May and November – in Connecticut, Massachusetts and New Hampshire. Eligibility: Projects to protect or preserve the environment, including improving a local wildlife habitat or starting and maintaining a recycling program. Providing education on environmental issues of local interest to adults or children. Improving the environment through organized cleanup projects (such as cleaning up a park, part of a stream or a vacant lot) or by reclaiming and rehabilitating damaged environments. For more information or to apply for a grant, contact the NU Environmental Management Department at (860) 665-3901	Unknown
Not-for-Profit Acid Mine Drainage	The U.S. Department of Interior's Acid Mine Drainage (AMD) Reclamation Program is designed to support the efforts of local not-for-profit organizations, especially watershed groups, to complete construction projects designed to clean streams impacted by AMD.	$2,700,000
Outdoor Classroom Program	To further environmental education across the Commonwealth's schools, the Massachusetts Executive Office of Environmental Affairs Outdoor Classroom Program is designed for municipalities, public schools, or public institutions of higher education in Massachusetts. The goal of the program is to assist these groups in restoring, improving, and/or researching natural areas on appropriately open and accessible private lands or public lands at a public school or municipal grounds. http://www.mass.gov/czm/outdoorclassroom.htm	Information Source
Partners for Fish and Wildlife Program	The Partners for Fish and Wildlife Program provides technical and financial assistance to private landowners to restore fish and wildlife habitats on their lands. Since 1987, the program has partnered with more than 33,000 landowners to restore 677,000 acres of wetlands; 1.2 million acres of grasslands and other upland habitats; and 5,600 miles of in-stream and streamside habitat. In addition, the program has reopened stream habitat for fish and other aquatic species by removing barriers to passage. The FY 2003 budget was $28 million and the FY 2004 budget for the Program is about $32 million.	$ 32 million
Private Stewardship Grants Program	The U.S. Fish and Wildlife Service's Private Stewardship Grants Program (PSGP) provides grants and other assistance on a competitive basis to individuals and groups engaged in private conservation efforts that benefit species listed or proposed as endangered or threatened under the Endangered Species Act of 1973, as amended, candidate species, or other at-risk species on private lands within the United States. Examples of the types of projects that may be funded include managing nonnative competitors, reintroducing imperiled species, implementing measures to minimize risk from disease in imperiled species populations, restoring streams that support imperiled species, fencing to exclude animals from sensitive habitats, and planting native vegetation to restore a rare plant community.	$ 7.5 million

Protecting Older Adults (EPA)	The U.S. Environmental Protection Agency (EPA) is currently accepting applications for projects that help protect older adults from environmental hazards such as air and water pollution. Projects must address one or more of the following goals: 1) train older adults, retirees and semi-retirees to be environmental leaders in their communities; 2) demonstrate new or experimental technologies, methods or approaches that reduce exposure to environmental health hazards; 3) build state, local and tribal capacity to protect the health of older adults from environmental hazards; 4) develop and implement intergenerational strategies that reduce exposure to environmental health hazards, and 5) demonstrate how smart growth activities can improve the quality of life for older adults while improving environmental quality. See http://www.lgean.org/html/whatsnew.cfm?id=739 and http://www.epa.gov/aging/grants/	$200,000
Public Works and Development Facilities Program	This program provides assistance to help distressed communities attract new industry, encourage business expansion, diversify local economies, and generate long-term, private sector jobs. Among the types of projects funded are water and sewer facilities, primarily serving industry and commerce; access roads to industrial parks or sites; port improvements; business incubator facilities; technology infrastructure; sustainable development activities; export programs; brownfields redevelopment; aquaculture facilities; and other infrastructure projects. Specific activities may include demolition, renovation, and construction of public facilities; provision of water or sewer infrastructure; or the development of stormwater control mechanisms (e.g., a retention pond) as part of an industrial park or other eligible project.	est. $232,100,000
Pulling Together Initiative	The National Fish and Wildlife Foundation's Pulling Together Initiative (PTI) provides a means for federal agencies to partner with state and local agencies, private landowners, and other interested parties to develop long-term weed management projects within the scope of an integrated pest management strategy. The goals of PTI are: (1) to prevent, manage, or eradicate invasive and noxious plants through a coordinated program of public/private partnerships; and (2) to increase public awareness of the adverse impacts of invasive and noxious plants. PTI provides support on a competitive basis for the formation of local weed management area (WMA) partnerships, allowing them to demonstrate successful collaborative efforts and develop permanent funding sources for the maintenance of WMAs from the involved parties. Successful projects will serve to increase public awareness and interest in future partnership projects.	Not yet available
Right Whale Research Grant Program (RWRGP)	The North Atlantic right whale is among the world's most endangered cetaceans. The population is believed to number only about 300 individuals and appears to be declining. The lack of recovery is due in part to high mortality from human sources, notably fishing gear entanglements and vessel collisions. A Recovery Plan is in effect, and conservation of this species is a high priority for NOAA Fisheries. Research directed at facilitating such conservation or to provide monitoring of the population's status and health, is also a high priority for the agency. The RWRGP is conducted by NOAA to provide Federal assistance to eligible researchers for: (1) detection and tracking of right whales; (2) behavior of right whales in relation to ships; (3) relationships between vessel speed, size or design with whale collisions; (4) modeling of ship traffic along the Atlantic coast; (5) population monitoring and assessment studies; (6) reproduction, health and genetic studies; (7) development of a Geographic Information System database or other system designed to investigate predictive modeling of right whale distribution in relation to environmental variables; (8) habitat quality studies including food quality and pollutant levels; and (9) any other work relevant to the recovery of North Atlantic right whales. Policy Advisor, Phone 301-713-0942 x122, Email Steve.J.Drescher@noaa.gov	$2,000,000
River Network	Directory of Funding Sources: Lists over 300 private, corporate and federal funding sources for river and watershed groups. http://www.rivernetwork.org/library/index.cfm?doc_id=117	Information Source

Riverways Small Grant Program	Initiated in 1987, the Small Grants Program provides modest amounts of money to promote the restoration and protection of the ecological integrity of Commonwealth's rivers, streams and adjacent lands. The grants have proven to be a wise investment for the Commonwealth as they foster action and result in benefits to the community that continue well after the grant period ends, as well as leverage local and foundation funding. This success is due to the energy, commitment and dedication of the partnerships formed by volunteers, watershed associations, local businesses, town officials and others that undertake the projects funded by the grants. In addition to providing seed money, Riverways also offer technical assistance, as appropriate, to both groups receiving grant awards and those that do not. http://www.mass.gov/dfwele/river/rivsmallgrnts.htm	Approx. $50,000 per year, on a dozen projects
Safe Drinking Water Act (SDWA) Source Water and Wellhead Protection Grants	SRF Set-Asides of the Safe Drinking Water Act: http://mass.gov/dep/brp/mf/files/ips.doc The purpose of the Source Water Protection Grant Program is to provide technical assistance to public drinking water suppliers through local and regional source protection efforts. Priority is given to projects that benefit public surface water supplies and systems that have both surface and groundwater sources; projects which address immediate threats in Zone A or Zone I; and projects which benefit public water supplies with an up-to-date, Department-approved, local Surface Water Supply Protection Plan. The Wellhead Protection Grant Program provides funding to public water systems for developing and implementing wellhead protection projects and plans. The direct recipients are public water suppliers; however, municipal boards, community groups, schools, and local and regional planning entities can develop and implement projects. All community public water systems (PWS) and non-transient non-community (NTNC) public water systems that serve schools are eligible to apply. The proposed work must benefit active drinking water sources.	Information Source
Science to Achieve Results	The Science to Achieve Results (STAR) program is designed to improve the quality of science used in EPA's decision-making process. STAR funds are provided for research in the following six areas: (1) Safe Drinking Water (includes source water protection), (2) High Priority Air Pollutants, (3) Research to Improve Human Health Risk Assessment, (4) Research to Improve Ecological Risk Assessment, (5) Emerging Issues, and (6) Pollution Prevention and New Technologies. The STAR program is intended to facilitate cooperation between EPA and the scientific community to help forge solutions to environmental problems. Research topic solicitations vary and are advertised in the Federal Register and through the Internet, university and scientific organizations, direct mail, and other avenues.	Not available
State Wildlife Grant Program (Non-Tribal)	The U.S. Fish and Wildlife Service's (USFWS) State Wildlife Grant (SWG) program provides grants to states, territories, and the District of Columbia for wildlife conservation. The SWG program provides funds to help develop and implement programs that benefit wildlife and their habitat, including species that are not hunted or fished. Although not directly eligible for these grants, third parties such as nonprofit organizations may benefit from these funds by working directly with their states to see if either grants or partnering opportunities are available.	$61.1 million

Superfund Technical Assistance Grants for Citizen Groups at Priority Sites	The EPA awards funds to qualified groups of individuals to procure independent technical advisors to help in interpreting and commenting on Superfund site-related information and decisions. Examples of how a technical advisor can help a group include, but are not limited to: reviewing preliminary site assessment/site investigation data; participating in public meetings to help interpret information about site conditions, proposed remedies, and the implementation of a remedy; visiting the site vicinity periodically during cleanup, if possible, to observe progress and provide technical updates to the group; and evaluating future land use options based on land use assumptions in the "remedial investigation/feasibility study". Funds can be used at sites that are listed on the National Priorities List (NPL) or proposed for the NPL where a "response" action has begun.	est. $1,200,000
Targeted Watershed Grants Program	EPA will ask Governors and tribal leaders for nominations and select up to 20 watershed organizations to receive grants to support innovative watershed based approaches to preventing, reducing, and eliminating water pollution. Nominations that are likely to result in environmental improvements in a relatively short time frame and that show broad stakeholder involvement would be strong candidates. Preference will be given to watershed plans that involve multiple states and/or tribes. The Initiative will also support local communities in their efforts to expand and improve existing protection measures with tools, training, and technical assistance.	$ 15 million
Technical Assistance for Coastal Managers Program	The Technical Assistance for Coastal Managers program represents an NOAA/CSC effort to improve the use of monitoring data and geospatial information and technology in coastal management through collaborative work with members of the coastal management community that have expertise in community planning and resource management. These activities will engage coastal managers from multiple organizations and levels of government and improve the management of coastal resources by applying geospatial knowledge, practices, and principles to new approaches for managing coastal resources. The Technical Assistance for Coastal Managers program contributes to other efforts at the NOAA/CSC and is designed to complement those efforts. Policy Advisor, Phone 301-713-0942 x122, Fax 301-713-0947, Email Steve.J.Drescher@noaa.gov	$1,750,000
Transportation Equity Act for the 21st Century Funding Programs	The Transportation Equity Act for the 21st Century (TEA-21) funds numerous transportation programs (Surface Transportation Program (STP), National Highway System, etc.) to improve the nation's transportation infrastructure, enhance economic growth, and protect the environment. States may spend up to 20 percent of their STP dollars for environmental restoration and pollution abatement projects, including the construction of stormwater treatment systems. Additionally, each state sets aside 10 percent of STP funds for transportation enhancement projects, which can include acquisition of conservation and scenic easements, wetland mitigation, and pollution abatement, as well as scenic beautification, pedestrian and bicycle trails, archaeological planning, and historic preservation. These varied project types can be used to protect source water areas during construction of transportation corridors.	Not yet available

Urban and Community Forestry Challenge Cost-Share Grants	The U.S. Forest Service's Urban and Community Forestry Challenge Cost-Share Grant Program seeks to establish sustainable urban and community forests by encouraging communities to manage and protect their natural resources. The program works to achieve a number of goals, including (1) effectively communicating information about the social, economic, and ecological values of urban and community forests; (2) involving diverse resource professionals in urban and community forestry issues; and (3) supporting a holistic view of urban and community forestry. In particular, the program supports an ecosystem approach to managing urban forests for their benefits to air quality, stormwater runoff, wildlife and fish habitat, and other related ecosystem concerns. The Forest Service awards these grants based on recommendations made by The National Urban and Community Forestry Advisory Council, a 15-member advisory council created by the 1990 Farm Bill to provide advice to the Secretary of Agriculture on urban and community forestry.	Not yet available
USDA National Research Initiative (NRI) Competitive Grants Program	The purpose of the NRI Program is to support research, extension, and education grants that address key problems of national, regional, and multistate importance in sustaining all components of agriculture (farming, ranching, forestry including urban and agroforestry, aquaculture, rural communities, human nutrition, processing, etc.). Providing this support requires that NRI advance fundamental sciences in support of agriculture and coordinate opportunities to build on these discoveries. Building on these discoveries will necessitate new efforts in education and extension that deliver science-based knowledge to people, allowing them to make informed practical decisions. Hence, in FY 2004 the NRI will accept applications for fundamental research, mission-linked research, and integrated research, extension, and education projects. Phone 202-720-4112, Fax 202-720-0857, Email webmaster@csrees.usda.gov	No funding in 2004
Water Quality Cooperative Agreements	These EPA grants are provided to help states, Indian tribes, interstate agencies, and other public or nonprofit organizations develop, implement, and demonstrate innovative approaches relating to the causes, effects, extent, prevention, reduction, and elimination of water pollution. This includes watershed approaches for combined sewer overflow, sanitary sewer overflows, and storm water discharge problems, pretreatment and sludge (biosolids) program activities, decentralized systems, and alternative ways to measure the effectiveness of point source programs. The estimate of funds available for fiscal year 2003 includes $20 million that has been requested for a new Watershed Initiative (WSI) program. Details for that program are currently being developed. If funds are appropriated for this program separate guidelines will be developed for the submittal, review, and approval of WSI projects.	$18,887,900
Water and Waste Disposal Systems for Rural Communities	This USDA Rural Utilities Service program provides monies to provide basic human amenities, alleviate health hazards, and promote the orderly growth of the rural areas of the nation by meeting the need for new and improved rural water and waste disposal facilities. Funds may be used for the installation, repair, improvement, or expansion of a rural water facility including costs of distribution lines and well pumping facilities. Funds also support the installation, repair, improvement, or expansion of a rural waste disposal facility, including the collection and treatment of sanitary waste stream, stormwater, and solid wastes.	Direct loans: est. $900,000,000; Guaranteed Loans est. $75,000,000; Grants: est. $600,000,000

Watershed Processes and Water Resources Program	The Watershed Processes program sponsors basic and mission-linked research that address two areas: (1) Understanding fundamental processes controlling a) source areas and flow pathways of water, b) the transport and fate of water, sediment, nutrients, dissolved matter, and organisms (including water-borne pathogens), within forest, rangeland, and agricultural environments as influenced by watershed characteristics and contaminant origin, and c) water quality. (2) Developing appropriate technology and management practices for improving the effective use of water (consumptive and non-consumptive) and protecting or improving water quality for agricultural and forestry production, including the evaluation of management policies that affect the quantity and quality of water resources.	Not yet available
Watershed Projects Grants Program (MA-DEP)	The Division of Municipal Services (DEP/DMS) is the section of the Massachusetts Department of Environmental Protection (MA DEP) responsible for awarding and administering several different state and federal programs that provide grant funding on a reimbursement basis for projects under the Bureau of Resource Protection's (BRP) Watershed Projects Program. These include: • 604b Water Quality Management Planning • 104(b)(3) Wetlands and Water Quality • 319(h) Nonpoint Source Grant Program • Source Water Technical Assistance/Land Management Grant Program (SWT) • Wellhead Protection Grant Program • Research and Demonstration Program http://mass.gov/dep/brp/mf/files/gguide.pdf	Information Source
Wetland Conservation Projects – US Fish and Wildlife Service	The U.S. Fish and Wildlife Service is accepting proposals for North American Wetlands Conservation Act (NAWCA) standard grant proposals. NAWCA proposals are four-year plans of action supported by a NAWCA grant and partner funds to conserve wetlands and wetlands-dependent fish and wildlife through acquisition (including easements and land title donations), restoration and/or enhancement, with a grant request between $51,000 and $1,000,000. Matching funds a required; they must be non-Federal and at least equal the grant request. Match is eligible up to 2 years prior to the year the proposal is submitted and grant and match funds are eligible after the proposal is submitted and through the project period. The deadline is July 30, 2004. For more information on developing proposals, contact David Buie at david_buie@fws.gov. See http://www.lgean.org/html/whatsnew.cfm?id=690 and http://birdhabitat.fws.gov/NAWCA/USstandgrants.html	$50,000 to $1,000,000 per grant
Wetlands Reserve Program	Through this voluntary program, the USDA Natural Resources Conservation Service (NRCS) provides landowners with financial incentives to restore and protect wetlands in exchange for retiring marginal agricultural land. To participate in the program landowners may sell a conservation easement or enter into a cost-share restoration agreement (landowners voluntarily limit future use of the land, but retain private ownership). Landowners and the NRCS jointly develop a plan for the restoration and maintenance of the wetland.	Not yet available
Wetlands Restoration Program (WRP)	GROWetlands Grant: Financial support for cities and towns to conduct wetlands restoration project design or implementation Must be for pro-active voluntary projects and not for mitigation purposes. The Massachusetts Wetlands Restoration Program has moved to the Office of Coastal Zone Management (CZM) within EOEA. The Corporate Wetlands Restoration Partnership is now an independent organization. See http://www.mass.gov/czm/wrp/index.htm	Information Source
104b3 Grant Program - Wetland and Water Quality	Brief descriptions of the sixty (60) Wetland and Water Quality projects financed under Section 104b3 Clean Water Act during federal fiscal years 1996 through 2001. September 2002. http://mass.gov/dep/brp/mf/files/idsum104.doc Water Quality and Wetland project priorities are established each year by the Department to support the Massachusetts Watershed Initiative and programmatic needs in the Department's Five-Year Basin Assessment and Planning cycle. These projects reflect state agency efforts in developing new approaches to protect the Commonwealth's wetland and water resources through data collection, data analysis, development of new Standard Operating Procedures, Total Maximum Daily Loading development and demonstration of Best Management Practices that address 303d listed waters.	$3.4 million 1996-2001

604(b) Program - Water Quality Management Planning Grants	Eligibility: Regional Public Comprehensive Planning Organizations or Interstate Organizations. EPA defines eligible entities as regional planning agencies, council of governments, counties, conservation districts, cities and towns, and other substate public planning agencies and interstate agencies. Eligible projects: - Assessment of Local Water Quality Protection Measures - Assessment of Land use Activities By Watershed - Assessment of Local and Regional Env. Awareness, Activities, and Concerns - Water Quality Assessment - Water Supply Source Protection Planning - Water Supply Development Planning - Watershed Wetlands Restoration Planning; Site-Specific Wetlands - Restoration Project Planning or Design -- Define the environmental (water quality) problem -- Key the project to the Watershed Action Plan -- Proposal should cover who, what, where, when, why, & outcomes For MA-DEP indicative project list, see http://mass.gov/dep/brp/mf/97604b.pdf	$180,000 in MA

Sources:

http://cfpub.epa.gov/fedfund/search1.cfm
http://www.nu.com/environmental/grant.asp
http://fedgrants.gov/Applicants/DOI/FWS/ES/PSGP-04/Grant.html
http://fedgrants.gov/Applicants/EPA/OGD/GAD/EPA-GRANTS-051304-002/listing.html
http://fedgrants.gov/grants/servlet/SearchServlet/

Previously Funded Roundtable Projects (FY99-02)

Fiscal year	Project Name	Vendor	Funding Agency	$allocated/ $spent	% complete	accomplishments
99	Determination of minimal base flow Saugus River	Gomez & Sullivan	DCR (DEM)	$50,000	95	Completed habitat assessment, draft final report submitted
99	Water Quality assessment in 4 NCW subwatersheds	SSCW, SWRC, MAS/NS	DEP	$36,357	100	Water Quality Assessment: Gloucester Harbor, North River, Saugus River, Smallpox Brook
99	Salem Sound 2000 Capacity Building Grant	SSCW	EOEA/ MWI	$50,000	100	Clean Beaches and Streams, Board of Directors, Citizen Wetland Health Program, North Coastal Watersheds Alliance
99	Stormwater Management Workshops for Local Officials		MCZM-NS		100	3 regional workshops were held, each workshop included examples of BMPs and projects implemented in both rural and urban settings, workbook and guidance documents were provided.
99	Growth Management	MCZM/ MAPC	EOEA PFG	$60,000	100	Conservation Subdivision Guidebook bylaw review
00	Setting action plan priorities in subwatersheds	North Shore Alliance	DEP	$18300	100	Conducted 5 community forums 1 general, 4 specific, brochure for each subwatershed
00	Targeting and Eliminating Untreated Sewage Discharges in Four Subwatersheds in the NCW	URS Consulting Group	DEP	$60,000	100	Completed Task 1 Identified stormwater drains. Conducted 2 rounds of sampling. Submitted draft final report.
00	Implementation of Land Protection Tech. Asst. Salt marsh Restoration	WB &RP	MCZM	$35,000	100	Submitted Draft Final Salt Marsh Restoration Plan for Rumney Marsh ACEC, initiated restoration plan for Great Salt Marsh, identified and evaluated salt marsh restoration project at Eastern Point Gloucester.

Fiscal year	Project Name	Vendor	Funding Agency	$allocated/ $spent	% complete	accomplishments
01	Inventory and Evaluation of Brownfield sites in the NCW	Daylor Assoc	DFWELE	$27,000	90%	Report completed, conducted several outreach meetings, awaiting the scheduling of training session for local communities.
01	Implementation of land protection technical assistance program in NS communities	Susan Jones Moses	MCZM/MB NS project manager	$35,000	50%	Contractor hired has contacted all communities in the NCW.
01	Technical Assistance for NPDES Stormwater Phase II Comp.	Vanasse Hangen Brustlin	DEP	$54,000	100%	Completed all workshops and presentations, Draft Final Report submitted
02	GIS Mapping in Selected Storm water Drainage Systems PHASE	TBD	EOEA/ MGIS	$30,000	0%	RFR recently posted on COMM PAS
02	Implementing Clean Beach Practices on the North Shore	TBD	EOEA/ MCZM	$10,000	0%	RFR recently posted on COMM PAS
02	Circuit Rider Provide local communities assistance in implementing CPA	TBD	EOEA/ MCZM		0%	
02	Documenting Anadromous Fish Runs/NS		MAS/NS, 8T&tB, SRWC		45%	First year of program nearly completed

Appendix H. Subwatersheds and Municipalities

North Coastal Subwatersheds and Municipalities

NCB 1 ANNISQUAM RIVER	GLOUCESTER
NCB 2 BASS RIVER	BEVERLY
NCB 3 BEVERLY HARBOR	BEVERLY, SALEM
NCB 4 DANVERS RIVER	DANVERS, PEABODY, BEVERLY, WENHAM
NCB 5 ESSEX BAY	ESSEX, GLOUCESTER, IPSWICH, HAMILTON, MANCHESTER, WENHAM, BEVERLY
NCB 6 GLOUCESTER HARBOR	GLOUCESTER
NCB 7 IPSWICH BAY	GLOUCESTER, IPSWICH
NCB 8 LYNN HARBOR	LYNN, NAHANT, REVERE
NCB 9 MANCHESTER HARBOR	MANCHESTER, GLOUCESTER, ESSEX
NCB 10 MARBLEHEAD HARBOR	MARBLEHEAD
NCB 11 NAHANT BAY	SWAMPSCOTT, LYNN, NAHANT, SALEM
NCB 12 NORTH RIVER	PEABODY, SALEM, LYNN, LYNNFIELD
NCB 13 PINES RIVER	REVERE, SAUGUS, MALDEN, EVERETT, MELROSE
NCB 14 SALEM HARBOR	SALEM, MARBLEHEAD, SWAMPSCOTT
NCB 15 SANDY BAY	ROCKPORT Called Rockport Harbor by DFWELE
NCB 16 SAUGUS RIVER	SAUGUS, MELROSE, LYNN, WAKEFIELD, MALDEN, REVERE, STONEHAM, READING

NCB 17 BLACKWATER RIVER	SALISBURY, SEABROOK NH, AMESBURY

THE SUBWATERSHEDS LISTED BELOW CONTAIN THE DFWELE VERSION PLUS TWO ADDITIONS ADDED TO REFLECT SUBWATERSHEDS TO THE SAUGUS RIVER (BEAVERDAM BROOK AND MILL RIVER)

NCB 18 ALEWIFE BROOK	ESSEX
NCB 19 BEAVERDAM BROOK	LYNNFIELD, NORTH READING in the DFWELE version looped in the Upper Saugus
NCB 20 BENNETS POND BROOK	SAUGUS, STONEHAM
NCB 21 BEVERLY ROCKS	BEVERLY
NCB 22 BROAD SOUND	REVERE, NAHANT
NCB 23 CAT BROOK	MANCHESTER, ESSEX
NCB 24 CHEBACCO LAKE	HAMILTON, ESSEX, WENHAM
NCB 25 CHUBB CREEK	BEVERLY
NCB 26 CRANE RIVER	DANVERS
NCB 27 FOREST RIVER	SALEM,SWAMPSCOTT
NCB 28 FROST FISH BROOK	DANVERS, BEVERLY
NCB 29 GOLDTHWAITE BROOK	PEABODY
NCB 30 GOOD HARBOR BEACH	GLOUCESTER
NCB 31 HALIBUT POINT	ROCKPORT, GLOUCESTER
NCB 32 HAWKES BROOK	LYNN, SAUGUS, LYNNFIELD

NCB 33 LANESVILLE	GLOUCESTER
NCB 34 MILL RIVER	WAKEFIELD In the DFWELE version looped in the Upper Saugus
NCB 35 PHILLIPS BEACH	SWAMPSCOTT, MARBLEHEAD
NCB 36 PROCTOR BROOK	PEABODY
NCB 37 REVERE BROOK	LYNN, SAUGUS
NCB 38 SAWMILL BROOK	ROCKPORT
NCB 39 SHUTE BROOK	SAUGUS, MELROSE
NCB 40 SMALLPOX BROOK	SALISBURY
NCB 41 STONY BROOK	LYNN, PEABODY
NCB 42 WALKER CREEK	GLOUCESTER, ESSEX
NCB 43 WOLFTRAP BROOK	MANCHESTER, GLOUCESTER

Appendix I. Surface Water Quality Standards

Table 3. Summary of Massachusetts Surface Water Quality Standards (DEP 1996). *Note: Italics are direct quotations*.

Dissolved Oxygen	Class A, BCWF*, SA : ? 6.0 mg/L and ≥ 75% saturation unless background conditions are lower Class BWWF**, SB: ? 5.0 mg/L and ≥ 60% saturation unless background conditions are lower Class C: Not ≤ 5.0 mg/L for more than 16 of any 24 –hour period and not ≤ 3.0 mg/L anytime unless background conditions are lower; levels cannot be lowered below 50% saturation due to a discharge Class SC: Not ≤ 5.0 mg/L for more than 16 of any 24 –hour period and not ≤ 4.0 mg/L anytime unless background conditions are lower; and 50% saturation; levels cannot be lowered below 50% saturation due to a discharge
Temperature	Class A: ≤ 68°F (20°C) and ? 1.5°F (0.8°C) for Cold Water and ≤ 83°F (28.3°C) and ? 1.5°F (0.8°C) for Warm Water Class BCWF: ≤ 68°F (20°C) and ? 3°F (1.7°C) due to a discharge Class BWWF: ≤ 83°F (28.3°C) and ? 3°F (1.7°C) in lakes, ? 5°F (2.8°C) in rivers Class C, SC: ≤85°F (29.4°C) nor ? 5°F (2.8°C) due to a discharge Class SA: ≤85°F (29.4°C) nor a maximum daily mean of 80°F (26.7°C) and ? 1.5°F (0.8°C) Class SB: ≤85°F (29.4°C) nor a maximum daily mean of 80°F (26.7°C) and ? 1.5°F (0.8°C) between July through September and ? 4.0°F (2.2°C) between October through June
pH	Class A, BCWF, BWWF: 6.5 – 8.3 and ? 0.5 outside the background range. Class C: 6.5 – 9.0 and ? 1.0 outside the naturally occurring range. Class SA, SB: 6.5 – 8.5 and ? 0.2 outside the normally occurring range. Class SC: 6.5 – 9.0 and ? 0.5 outside the naturally occurring range.
Fecal Coliform Bacteria	Class A: an arithmetic mean of < 20 organisms /100 ml in any representative set of samples and < 10% of the samples > 100 organisms/100 ml. Class B: a geometric mean of < 200 organisms /100 ml in any representative set of samples and < 10% of the samples > 400 organisms /100 ml. (This criterion can be applied on a seasonal basis at the discretion of the DEP.) Class C: a geometric mean of < 1000 organisms /100ml, and < 10% of the samples > 2000 organisms/100 ml. Class SA: approved Open Shellfish Areas: a geometric mean (MPN method) of < 14 organisms/100 ml and < 10% of the samples > 43 organisms/100 ml (MPN method). Waters not designated for shellfishing: < a geometric mean of 200 organisms in any representative set of samples, and < 10% of the samples > 400 organisms /100 ml. (This criterion can be applied on a seasonal basis at the discretion of the DEP.) Class SB: approved Restricted Shellfish Areas: < a fecal coliform median or geometric mean (MPN method) of 88 organisms/100 ml and < 10% of the samples > 260 organisms /100 ml (MPN method). Waters not designated for shellfishing: < a geometric mean of 200 organisms in any representative set of samples, and < 10% of the samples > 400 organisms /100 ml. (This criterion can be applied on a seasonal basis at the discretion of the DEP.) Class SC: < a geometric mean of 1000 organisms/100 ml and < 10% of the samples > 2000 organisms/100ml.
Solids	All Classes: *These waters shall be free from floating, suspended, and settleable solids in concentrations or combinations that would impair any use assigned to each class, that would cause aesthetically objectionable conditions, or that would impair the benthic biota or degrade the chemical composition of the bottom.*
Color and Turbidity	All Classes: *These waters shall be free from color and turbidity in concentrations or combinations that are aesthetically objectionable or would impair any use.*
Oil & Grease	Class A, SA: *Waters shall be free from oil and grease, petrochemicals and other volatile or synthetic organic pollutants.* Class SA: *Waters shall be free from oil and grease and petrochemicals.* Class B, C,SB, SC: *Waters shall be free from oil and grease, petrochemicals that produce a visible film on the surface of the water, impart an oily taste to the water or an oily or other undesirable taste to the edible portions of aquatic life, coat the banks or bottom of the water course or are deleterious or become toxic to aquatic life.*
Taste and Odor	Class A, SA: *None other than of natural origin.* Class B, C,SB, SC: *None in such concentrations or combinations that are aesthetically objectionable, that would impair any use assigned to each class, or that would cause tainting or undesirable flavors in the edible portions of aquatic life.*

Aesthetics	All Classes: *All surface waters shall be free from pollutants in concentrations or combinations that settle to form objectionable deposits; float as debris, scum or other matter to form nuisances; produce objectionable odor, color, taste or turbidity; or produce undesirable or nuisance species of aquatic life.*
Toxic Pollutants ~	All Classes: *All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life or wildlife… The division shall use the recommended limit published by EPA pursuant to 33 USC 1251, 304(a) as the allowable receiving water concentrations for the affected waters unless a site-specific limit is established.*
Nutrients	*Shall not exceed the site-specific limits necessary to control accelerated or cultural eutrophication.*

*Class BCWF = Class B Cold Water Fishery, ** Class BWWF = Class B Warm Water Fishery, ? criterion (referring to a change from ambient) is applied to the effects of a permitted discharge. ~ EPA. 19 November 1999. Federal Register Document. [Online]. United States Environmental Protection Agency. http://www.epa.gov/fedrgstr/EPA-WATER/1998/December/Day-10/w30272.htm.

Appendix J. Designated Uses

The Massachusetts Surface Water Quality Standards designate the most sensitive uses for which the surface waters of the Commonwealth shall be enhanced, maintained and protected. Each of these uses is briefly described below (DEP 1996):

AQUATIC LIFE - suitable habitat for sustaining a native, naturally diverse, community of aquatic flora and fauna. Three subclasses of aquatic life are also designated in the standards for freshwater bodies; *Cold Water Fishery* - capable of sustaining a year-round population of cold water aquatic life such as trout, *Warm Water Fishery* - waters which are not capable of sustaining a year-round population of cold water aquatic life, and *Marine Fishery* - suitable for sustaining marine flora and fauna.

FISH CONSUMPTION - pollutants shall not result in unacceptable concentrations in edible portions of marketable fish or shellfish or for the recreational use of fish, shellfish, other aquatic life or wildlife for human consumption.

PRIMARY CONTACT RECREATION - suitable for any recreation or other water use in which there is prolonged and intimate contact with the water with a significant risk of ingestion of water. These include, but are not limited to, wading, swimming, diving, surfing and water skiing.

SECONDARY CONTACT RECREATION - suitable for any recreation or other water use in which contact with the water is either incidental or accidental. These include, but are not limited to, fishing, boating and limited contact incident to shoreline activities.

DRINKING WATER - used to denote those waters used as a source of public drinking water. They may be subject to more stringent regulation in accordance with the Massachusetts Drinking Water Regulations (310 CMR 22.00). These waters are designated for protection as Outstanding Resource Waters under 314 CMR 4.04(3).

AGRICULTURAL AND INDUSTRIAL - suitable for irrigation or other agricultural process water and for compatible industrial cooling and process water.

SHELLFISH HARVESTING (in SA and SB segments) – Class SA waters in approved areas (Open Shellfish Areas) shellfish harvested without depuration shall be suitable for consumption; Class SB waters in approved areas (Restricted Shellfish Areas) shellfish harvested with depuration shall be suitable for consumption.

AESTHETICS - all surface waters shall be free from pollutants in concentrations or combinations that settle to form objectionable deposits; float as debris, scum or other matter to form nuisances; produce objectionable odor, color, taste or turbidity; or produce undesirable or nuisance species of aquatic life.

Other restrictions, which denote specific subcategories of use assigned to the segment that, may affect the application of criteria or specific antidegradation provision of 314 CMR 4.00 which are specified in segments of the North Coastal Watersheds include:

Combined Sewer Overflow (CSO) – These waters are identified as impacted by the discharge of combined sewer overflows in the classification tables in 314 CMR 4.06(3). The permitting authority without a variance or partial use designation may allow overflow events where the provisions 314 CMR 4.06(1)(d)10 are met. The waterbody may be subject to short-term impairment of swimming or other recreational uses, but support these uses through most of their annual period of use; and the aquatic life community may suffer some adverse impact yet is still generally viable).

The guidance used to assess each designated use follows.

J1. AQUATIC LIFE USE

This use is suitable for sustaining a native, naturally diverse, community of aquatic flora and fauna. The results of biological (and habitat), toxicological, and chemical data are integrated to assess this use. The nature, frequency, and precision of the DEP's data collection techniques dictate that a weight of evidence be used to make the assessment, with biosurvey results used as the final arbiter of borderline cases. Excursions from criteria due to natural conditions are not considered impairment of use. The following chart provides an overview of the guidance used to assess the status (support, partial support, non support) of the *Aquatic Life Use*:

Variable (# indicates reference)	***Support***—Data available clearly indicates support. Minor excursions from chemical criteria (Table 3) may be tolerated if the biosurvey results demonstrate support.	***Partial Support*** – Uncertainty about support in the chemical or toxicity testing data, or there is some minor modification of the biological community. Excursions not frequent or prolonged.	***Non Support*** – There are frequent or severe violations of chemical criteria, presence of acute toxicity, or a moderate or severe modification of the biological community.
BIOLOGY			
Rapid Bioassessment Protocol (RBP) II or III (4)	Non-Impaired	Slightly Impaired	Moderately or Severely Impaired
Fish Community (4)	BPJ*	BPJ*	BPJ*
Habitat and Flow (4)	BPJ*	BPJ*	Dry Streambed due to artificial regulation or channel alteration
Macrophytes (4)	No non-native plant species present, BPJ	Non-native plant species present but not dominant, BPJ*	Non-native plant species dominant, BPJ*
Plankton/ Periphyton (4)	No algal blooms	Occasional algal blooms	Persistent algal blooms
TOXICITY TESTS			
Water Column (4)	>75% survival either 48 hr or 7-day exposure	>50 - ≤75% survival either 48 hr or 7-day exposure	≤50% survival either 48 hr or 7-day exposure
Effluent (4)	Meets permit limits	(NOTE: if limit is not met, the stream is listed as threatened for 1.0 river mile downstream from the discharge.)	
Sediment (4)	>75% survival	>50 - ≤75% survival	≤50% survival
CHEMISTRY- WATER			
DO (3, 6)	Criteria (Table 3)	Criteria exceeded in 11-25% of measurements.	Criteria exceeded >25% of measurements.
pH (3, 6)	Criteria (Table 3)	Criteria exceeded in 11-25% of measurements.	Criteria exceeded >25% of measurements.
Temperature (3, 6) ***	Criteria (Table 3), ***	Criteria exceeded in 11-25% of measurements.	Criteria exceeded >25% of measurements.
Turbidity (4)	? 5 NTU due to a discharge	BPJ*	BPJ *
Suspended Solids (4)	25 mg/L max., ? 10 mg/L due to a discharge	BPJ*	BPJ*

Nutrients (3) Phosphate-P (4)	Table 3, (Site-Specific Criteria; Maintain Balanced Biocommunity, no pH/DO violations)	BPJ*	BPJ*
Toxic Pollutants (3, 6) Ammonia-N (3, 4) Chlorine (3, 6)	Criteria (Table 3) 0.254 mg/L**** NH_3-N 0.011 mg/L TRC	Criterion is exceeded in ≤ 10% of samples.	Criterion is exceed in > 10% of samples.
CHEMISTRY – SEDIMENT			
Toxic Pollutants (5)	≤ L-EL*****	One pollutant between L-EL and S-EL	One pollutant ? S-EL
Nutrients (5)	≤ L-EL	between L-EL and S-EL	? S-EL
Metal Normalization to Al or Fe (4)	Enrichment Ratio ≤ 1	Enrichment Ratio >1 but ≤10	Enrichment Ratio ≥10
CHEMISTRY- EFFLUENT			
Compliance with permit limits (4)	In-compliance with all limits	NOTE: If the facility is not in compliance with their permit limits, the information is used to threaten one river mile downstream from the discharge.	
CHEMISTRY-TISSUE			
PCBs – whole fish (1)	≤500 ? g/Kg wet weight	BPJ*	BPJ*
DDT (2)	≤14.0 ? g/Kg wet weight	BPJ*	BPJ*
PCBs in aquatic tissue (2)	≤0.79 ng TEQ/Kg wet weight	BPJ*	BPJ*

*BPJ = Best Professional Judgment, ***maximum daily mean temp. in a month (minimum of 6 measurements evenly distributed over 24-hours) <criterion, ****Ammonia levels for pH of 9.0, actual "criterion" varies with pH and is evaluated case-by-case, *****L-EL = Low Effect Level and S-EL = Severe Effect Level

J2. FISH CONSUMPTION USE

Pollutants shall not result in unacceptable concentrations in edible portions of marketable fish or shellfish or for the recreational use of fish, shellfish, other aquatic life or wildlife for human consumption. This assessment is made using the most recent list of Fish Consumption Advisories issued by the Massachusetts Executive Office of Health and Human Services, Department of Public Health (MA DPH), Bureau of Environmental Health Assessment Fish Consumption Advisory List. Following is an overview of the guidance used to assess the status (support, partial support, non-support) of the fish consumption use.

Variable (# indicates reference)	***Support*** —No restrictions or bans in effect	***Partial Support*** – A "restricted consumption" fish advisory is in effect for the general population or a sub-population that could be at potentially greater risk (e.g., pregnant women, and children	***Non Support*** – A "no consumption" advisory or ban in effect for the general population or a sub-population for one or more fish species; or there is a commercial fishing ban in effect
MA DPH Fish Consumption Advisory List (8)	Not applicable, precluded by statewide advisory (Hg)	Not applicable	Waterbody on MA DPH Fish Consumption Advisory List

* NOTE: In 1994, MA DPH issued a statewide *Interim Freshwater Fish Consumption Advisory* for mercury. This precautionary measure was aimed at pregnant women only; the general public was not considered to be at risk from fish consumption. The advisory encompasses all freshwaters in Massachusetts therefore the *Fish Consumption Use* will no longer be assessed as support.

J3. DRINKING WATER USE

Drinking Water Use denotes those waters used as a source of public drinking water. These waters may be subject to more stringent regulation in accordance with the Massachusetts Drinking Water Regulations (310 CMR 22.00). They are designated for protection as Outstanding Resource Waters in 314 CMR 4.04(3). DEP's Drinking

Water Program (DWP) maintains current drinking water supply data for active public water supplies. When a source has been placed on "emergency or backup" status no testing is required. The *Drinking Water Use* is not assessed in this report however, EPA guidance is provided below.

Variable (# indicates reference)	***Support***-- No closures or advisories (no contaminants with confirmed exceedances of MCLs, conventional treatment is adequate to maintain the supply).	***Partial Support*** – Is one or more advisories or more than conventional treatment is required	***Non Support*** – One or more contamination-based closures of the water supply
Drinking Water Program (DWP) Evaluation	Reported by DWP	Reported by DWP	Reported by DWP

J4. SHELLFISHING USE

This use is assessed using information from the Department of Fisheries, Wildlife and Environmental Law Enforcement's Division of Marine Fisheries (DMF). The information is in the form of various classifications of shellfish closures and restrictions. Shellfish areas under management orders are *not assessed.*

Variable (# indicates reference)	***Support*** – SA Waters—open for shellfish harvesting without depuration (Open areas) SB Waters—open for shellfish harvesting with depuration (Open, conditionally approved, restricted areas)	***Partial Support*** – SA Waters—Seasonally closed, seasonally open, conditionally approved, conditionally restricted SB Waters—Seasonally closed, seasonally open, conditionally restricted areas	***Non Support*** – SA Waters—Prohibited, areas SB Waters—Prohibited, areas
Division of Marine Fisheries Shellfish Project Classification Area Information (11)	Reported by DMF	Reported by DMF	Reported by DMF

J5. PRIMARY CONTACT RECREATIONAL USE

This use is suitable for any recreational or other water use in which there is prolonged and intimate contact with the water with a significant risk of ingestion of water (1 April to 15 October). These include, but are not limited to, wading, swimming, diving, surfing and water skiing. The chart below provides an overview of the guidance used to assess the status (support, partial support, non-support) of the primary contact use.

Variable (# indicates reference)	***Support***-- Criteria are met, no aesthetic conditions that preclude the use	***Partial Support*** –Criteria exceeded intermittently (neither frequent nor prolonged), marginal aesthetic violations	***Non Support*** –Frequent or prolonged violations of criteria, formal bathing area closures, or severe aesthetic conditions that preclude the use
Fecal Coliform Bacteria (3, 9) *	Criteria met OR <u>Dry Weather Guidance</u> <5 samples--≤400/100 ml maximum <u>Wet Weather Guidance</u> Dry weather samples meet and wet samples ≤2000/100 ml	Guidance exceeded in 11-25% of the samples OR <u>Wet Weather</u> Dry weather samples meet and wet samples ≥2000/100 ml	Guidance exceeded in > 25% of the samples
pH (3, 6)	Criteria exceeded in ≤10 % of the measurements	Criteria exceeded in 11-25% of the measurements	Criteria exceeded in >25% of the measurements

Temperature (3)	Criteria met	Criteria exceeded 11-25% of the time	Criteria exceeded 25% of the time
Color and Turbidity (3, 6)	? 5 NTU (due to a discharge) exceeded in <10 % of the measurements	Guidance exceeded in 11-25% of the measurements	Guidance exceeded in >25% of the measurements
Secchi disk depth (10) **	Lakes - ≥1.2 meters (≥ 4')	Infrequent excursions from the guidance	Frequent and/or prolonged excursions from the guidance
Oil & Grease (3)	Criteria met	Criteria exceeded 11-25% of the time	Criteria exceeded >25% of the time
Aesthetics (3) Biocommunity (4)**	No nuisance organisms that render the water aesthetically objectionable or unusable; Lakes – cover of macrophytes < 50% of lake area at maximum extent of growth.	Lakes – cover of macrophytes 50-75% of lake area at their maximum extent of growth.	Lakes – cover of macrophytes >75% of lake area at their maximum extent of growth.

Note: Excursions from criteria due to natural conditions are not considered impairment of use. The Primary Contact Use support status cannot be rated higher then Secondary Contact. ***** Fecal Coliform Bacteria interpretations require additional information in order to apply this use assessment guidance. Bacteria data results (fecal coliform) are interpreted according to whether they represent dry weather or wet weather (stormwater runoff) conditions. Accordingly it is important to interpret the amount of precipitation received in the subject region immediately prior to sampling and streamflow conditions. ****** Lakes exhibiting impairment of the primary contact recreation use (swimmable) because of macrophyte cover and/or transparency (Secchi disk depth) are assessed as either *partial* or *on support*. If no fecal coliform bacteria data are available and the lake (entirely or in part) met the transparency (Secchi disk depth) and aesthetics guidance this use is *not assessed*.

J6. SECONDARY CONTACT RECREATIONAL USE

This use is suitable for any recreation or other water use in which contact with the water is either incidental or accidental. These include, but are not limited to, fishing, boating and limited contact incident to shoreline activities. Following is an overview of the guidance used to assess the status (support, partial support, non-support) of the secondary contact use.

Variable (# indicates reference)	***Support***-- Criteria are met, no aesthetic conditions that preclude the use	***Partial Support*** –Criteria exceeded intermittently (neither frequent nor prolonged), marginal aesthetic violations	***Non Support*** –Frequent or prolonged violations of criteria, or severe aesthetic conditions that preclude the use
Fecal Coliform Bacteria (4) *	Dry Weather Guidance <5 samples--≤2000/100 ml maximum >5 samples--≤1000/100 ml geometric mean ≤ 10% samples ≥2000/100 ml Wet Weather Guidance Dry weather samples meet and wet samples ≤4000/100 ml	Wet Weather Guidance Dry weather samples meet and wet samples ≥4000/100 ml	Criteria exceeded in dry weather
Oil & Grease (3)	Criteria met	Criteria exceeded 11-25% of the time	Criteria exceeded >25% of the time
Aesthetics (3) Biocommunity (4) **	No nuisance organisms that render the water aesthetically objectionable or unusable; Lakes – cover of macrophytes < 50% of lake area at their maximum extent of growth.	Macrophyte cover is between 50 – 75%	Macrophyte cover exceeds 75% of the lake area.

Note: Excursions from criteria due to natural conditions are not considered impairment of use. The *Secondary Contact Use* support status cannot be higher then the *Aesthetics Use* status. * Fecal Coliform Bacteria interpretations require additional information in order to apply this use assessment guidance. Bacteria data results (fecal coliform) are interpreted according to whether they represent dry weather or wet weather (stormwater runoff) conditions. Accordingly it is important to interpret the amount of precipitation received in the study region immediately prior to sampling and streamflow conditions. ** In lakes if no fecal coliform data are available, macrophyte cover is the only criterion used to assess the secondary contact recreational use.

For the Primary and Secondary Contact Recreational uses the following steps are taken to interpret the fecal coliform bacteria results:

Identify the range of fecal coliform bacteria results,

Calculate the geometric mean (monthly, seasonally, or on dataset), (Note: the geometric mean is only calculated on datasets with >5 samples collected in a 30-day period.)

Calculate the % of sample results exceeding 400 cfu/100 mL,

Determine if the samples were collected during wet or dry weather conditions (review precipitation and streamflow data),

Dry weather can be defined as: No/trace antecedent (to the sampling event) precipitation that causes more than a slight increase in stream flow.

Wet weather can be defined as: Precipitation antecedent to the sampling event that results in a marked increase in stream flow.

Apply the following to interpret dry weather data:

≤10% of the samples exceed criteria (step 2 and 3, above) assessed as Support,

11-25% of the samples exceed criteria (step 2 and 3, above) assessed as Partial Support,

>25% of the samples exceed criteria (step 2 and 3, above) assessed as Non Support.

J7. AESTHETICS USE

All surface waters shall be free from pollutants in concentrations or combinations that settle to form objectionable deposits; float as debris, scum or other matter to form nuisances; produce objectionable odor, color, taste or turbidity; or produce undesirable or nuisance species of aquatic life. The aesthetic use is closely tied to the public health aspects of the recreational uses (swimming and boating). Below is an overview of the guidance used to assess the status (support, partial support, non-support) of the aesthetics use.

Variable (# indicates reference)	*Support*— 1.No objectionable bottom deposits, floating debris, scum, or nuisances; 2. objectionable odor, color, taste or turbidity, or nuisance aquatic life	*Partial Support* – Objectionable conditions neither frequent nor prolonged	*Non Support* – Objectionable conditions frequent and/or prolonged
Aesthetics (3)* Visual observation (4)	Criteria met	BPJ (spatial and temporal extent of degradation)	BPJ (extent of spatial and temporal degradation

Note: Excursions from criteria due to natural conditions are not considered impairment of use.

For lakes, the aesthetic use category is generally assessed at the same level of impairment as the more severely impaired recreational use category (primary or secondary contact).

Appendix K. Permits and Registrations

K1. North Coastal NPDES permits

National Pollutant Discharge Elimination System (NPDES) permits in the North Coastal Watersheds.

These facilities are briefly described below. Major permittees are highlighted in **bold**:

MA0025707 Twin Light Manor Motor Inn, Gloucester discharge of 0.002 MGD to the Atlantic Ocean was to have been eliminated by 1 Oct 1975. Record of Title V violations in the permit file.

MA0025500 Easterly Inn, Gloucester discharge of 0.0035 MGD to the Atlantic Ocean. Information in permit file indicates Easterly Inn was going to tie into the Gloucester WWTP. Current status is unknown.

MA0100625 The city of Gloucester has a primary wastewater treatment facility under 301h waiver authority which discharges outside of Gloucester Harbor proper into the Atlantic Ocean. Four CSO discharge locations as well as three pump station bypass outfalls also discharge directly into Gloucester Harbor as authorized by this NPDES permit. These outfalls are summarized below:

Discharge Point	Description	Discharge Rate (MGD)	Frequency (Days/Year)
002	Mansfield Street Drain Western Ave CSO	6.0	60
004	Rogers Street CSO	1.6	48
005	Main Street CSO	1.4	48
006	East Main Street CSO	1.4	48
003	Fort Square Bypass	0.025	4
007	State Fish Pier “tide gate”	0.025	6
008	Beacon Marine Bypass	0.015	4
011	Riverside Avenue Bypass	0.015	4
012	Grant Circle Bypass	0.02	4

MA0100145 The Rockport WWTP discharges 0.8 MGD of treated municipal wastewater to Sandy Bay. Sandy Bay is outside of Rockport Harbor proper.

MA0090654 The town of Rockport Cape Ann Lighthouse discharges 0.0012 MGD of treated sanitary wastewater to the Atlantic Ocean from the facility on Thatcher’s Island, which is approximately one mile east of Rockport. (This permit was issued July 1982). Current status is unknown.

MAG640021 Town of Rockport water treatment facility discharge to Cape Pond a Class A waterbody.

MAG640003 Town of Manchester-by-the-Sea discharge from the Gravelly Pond Water Treatment Facility to Gravelly Pond, a Class A waterbody. This discharge began in June 1998. The first two DMR reports indicated a total residual chlorine (TRC) concentration of 3 mg/L between April and June 1998 and a concentration of 1mg/L between July and September 1998.

MAG250520 Varian Associates, Inc. is authorized to discharge non-contact cooling water (city water supply) into an unnamed tributary of the Bass River. According to the company, outfall #001 discharges an average monthly flow of 0.00004MGD outfall #002 discharges 0.00009 MGD. The companies records indicate that outfall #001 the maximum discharge in 1997 and 1998 was 0.01 and 0.0008 MGD, respectively, whereas at outfall #002 the maximum discharge in 1997 and 1998 was 0.009 and 0.00004, respectively (Coker 1999).

MAS000013 Varian Associates, Inc. has submitted an application for an individual stormwater permit.

MA0001830 Lynn Sand & Stone Company discharge of quarry water, cooling water, and concrete slurry to a lagoon adjacent to Foster's Dam Pond. This permit expired in December 1979 and apparently the facility is still operating under that permit.

MA0100374 The town of Marblehead is only allowed to discharge under emergency conditions from the Sargent Road Pump Station Overflow. The overflow is screened and chlorinated prior to discharge into Massachusetts Bay.

MA0034819 – Thermadyne Wingaersheek Building.

MA0003859 GTE Sylvania, Inc., Sylvan Street Plant, Danvers is authorized to discharge via outfalls #001 0.334 MGD and #002 0.06 MGD of non-contact cooling water to an "unnamed tributary of Mill Pond" (Crane Brook), Danvers.

MA0030091 – Riverside Condominiums, Danvers. 21 E hazardous waste site (#3-12423) discharge permit.

MA0036331 – Crane River West Condominiums Stormwater Discharge, Danvers.

MA0003956 Eastman Gelatine Corporation discharges non-contact cooling water (0.5 MGD average monthly flow) and storm water runoff from outfall 001 and storm water runoff from 18 other outfalls into Goldthwaite Brook. The facility is engaged in the manufacturing of photographic gelatin. The wastewater generated from the gelatin process is discharged to the Peabody sewer system that in turn is part of the South Essex Sewage District.

MAG640006 Coolidge Avenue Water Treatment Facility is authorized to discharge filter backwash water to Spring Pond and emergency overflows to Tapley Brook.

MA0028584 Stahl Finishing, Peabody 21 E hazardous waste site (3-0413) discharge permit.

MA0028215 Permuthane Inc, Peabody. The permit has expired and outfall pipes #007 and #008 are regulated under Stahl USA general permit MA0035467.

MA0023132 Peabody Municipal Light Plant is an old power generating plant (built in 1948) and used rarely according to a letter from the facility dated 1978. The company's 1980 permit authorized a discharge of overflow water from a cooling pond (estimated 0.005 MGD daily average, 0.01 MGD daily maximum), via outfall #001, into Proctor Brook near Warren Street in Peabody. The letter from the company also stated that the cooling pond water was treated with a product purchased from W.H. & L.D. Betz to prevent rust or corrosion in the pipes. The permit limited the discharge to no more than twice per year for no greater period than one day. A narrative statement in the permit limited temperature to "*No increase above that of the receiving body of water*."

MA0025372 Salem Oil & Grease Company, a manufacturer and importer of tanner's oils, is authorized to discharge via outfall #001 0.0024 MGD of process equipment cooling water and air conditioner cooling water. Permit was issued December 1975. Chapter 21E r-3-2131 NFA (no further action)

MA0026794 Bayoil Co., Inc, a manufacturer of leather oil was authorized to discharge 0.013 MGD of non-contact cooling water drawn from an artesian well into a municipal (Peabody) storm drain. This discharge most likely goes into Proctor Brook. This permit was issued in 1978 and there was no reapplication in the permit file. Current status of facility is unknown.

MA0033723 Federal Express. Chapter 21E 3-2221

MA0005096 USGenNE (formerly New England Power Salem Station) has several outfalls:

Outfall 001: 668.9 MGD of condenser cooling water, boiler blowdown, reboiler and evaporator blowdown, freshwater storage tank overflow, service water, boiler blowdown tanks, and stormwater runoff from the yard. The permit also stated that "at no time can the outfall exceed an absolute temperature of 93?F" and further stated that "at no time can temperature of this outfall exceed a 28?F rise over intake temperature." The permit also required that "a temperature differential between the point of discharge and the intake structure shall not change more than 12?F during any one-hour period from 1 April to 31 October nor shall the differential change more than 9?F between 1 November and 31 March during any one-hour period."

Outfall 006: 1.5 MGD average monthly/2.6 MGD maximum daily discharge of wastewater treatment service-ash settling point, Unit 4 seal water, floor drains, equipment drains, demineralizer/regenerator wastes, equipment wash water systems, bottom ash recycle system blowdown, stormwater from yard drains and coal pile runoff.

Outfalls 005 and 007: intake screen wash water.

Outfall 014: 19.2 MGD maximum daily discharge of condenser cooling water plus intermittent heat recycle cooling water up to a temperature of 115?F within the four-hour period used to control biological fouling of the condenser systems.

Outfall 015: emergency spillway overflow.

25. **MA0100501**--The South Essex Sewer District WWTP (SESD) discharges treated secondary wastewater to Salem Sound. The facility has recently (June 1998) been upgraded to secondary treatment and discharges through a 660-foot multiport diffuser. Dechlorination was also added to the treatment facility and became operational in the spring of 1998. The treatment plant is under start up conditions and working to establish its standard operational procedures.

MA0100871--The Manchester By-The-Sea WWTP discharges 0.67 MGD of treated municipal wastewater to Massachusetts Bay near to Sauli Rock outside of Manchester Harbor proper. The Manchester POTW was upgraded from primary to a full secondary facility as of August 1998 per the requirements of the Administrative Consent Order AP-BO-92-101. All new units were on-line as of an inspection conducted by DEP on 10 February 1999.

MA0100552 The Lynn Water and Sewer Commission (LWSC) serves the city of Lynn and the towns of Nahant, Swampscott, and Saugus is a secondary WWTP that became operational in January 1991. A new permit for the facility was drafted in August 1999. The facility discharges an average monthly flow of 25.8 and up to 75 MGD of treated municipal and industrial wastewater via outfall 001 to Lynn Harbor (or Broad Sound?). Of the 25.8 MGD total wastewater flow, 2.3 MGD is industrial. Flows in excess of 75 MGD discharge via outfall 002 (the short outfall) into Lynn Harbor.

LWSC also has three wet weather CSO outfalls which discharge into Lynn Harbor (outfalls 004—Market Street Overflow, and 005 Broad Street Overflow).

Outfall #003 MA0100552 discharges to the “Little River” Street portion (also referred to as Strawberry Brook) of the Saugus River and #008 discharge to Saugus River.

Outfall #006, Sanderson Avenue is a wet weather CSO that discharges into Stacy Brook. This brook discharges to Kings Beach.

MA0101907The Swampscott WWTP discharge to Nahant Bay was tied into the LWSC facility on 2 June 1992. The status of the three remaining discharges (002, 003, and 004) of contaminated stormwater including urban runoff and an intermittent discharge of untreated combined sewage (all possibly chlorinated) to Nahant Bay and Stacey Brook is currently unknown. These outfalls are briefly described below:

002: Sculpin Way Drain discharge of contaminated stormwater, including urban runoff and chlorine to Nahant Bay.

003: Marshall Brook Drain discharge of contaminated stormwater, including urban runoff and chlorine to Nahant Bay.

004: New Ocean Street Underdrain intermittent discharge of untreated combined sewage and chlorine to Stacey Brook.

MA0026247 Power Products, Inc., Wakefield discharges non-contact cooling water and stormwater runoff to “a surface drainage channel to the Saugus River (approx. 1 mile from discharge point).”

MAG640017 Lynnfield Center Water District was issued a general water treatment plant discharge permit in November 1995.

MAG250965 the Wakefield Corporation discharge of non-contact cooling water to a tributary of Mill River called “Wakefield Brook” in their permit.

MA0002356 Wakefield Bearing Corp.

MA0034452 Spirit Inc.

MA0103004 Crystal Lake Water Treatment Plant, applied for a permit in May 1986.

MA0028193 The Refuse Energy Systems Company (RESCO). The facility is engaged in trash burning and power generation and became operational in September 1985. RESCO withdraws water from the Saugus River at their intake structure located just southeast of the Route 107 (Salem Turnpike) in East Saugus. The Saugus River also forms the municipal boundary between Saugus and Lynn. They discharge, via outfall 001, 60 MGD of once through non-contact cooling water. The permit limit for temperature at the outfall is 90?F max and at no time is the discharge to exceed a 20?F rise over the temperature of the intake.

MA0003905 General Electric Company, Lynn (GE Lynn) currently maintains 15 permitted discharge outfalls along the northern bank of the Saugus River from Route 107 (Western Avenue) and Route 1A (General Edwards Bridge) in Lynn. The discharges are summarized from west to east as follows:

001: stormwater runoff from roof and yard drains

*003: average flow of 0.55 MGD up to 95?F and daily maximum 1.4 MGD of 105?F of non-contact cooling water. (water supplied by city)

*005: average flow of 0.55 MGD up to 95?F and daily maximum 1.4 MGD of 105?F of non-contact cooling water. (water supplied by city)

*007: average flow of 0.024 MGD up to 90?F and emergency discharge from test cells of average flow of 0.3 MGD up to 95?F and daily maximum 1.0 MGD of 105?F of non-contact cooling water, stream condensate and storm water runoff

*Note: outfalls (003, 005 and 007) may discharge only under emergency system shutdowns, otherwise the discharges have been eliminated by the installation of closed loop systems.

010: average flow of 5.36 MGD up to 85.2?F and daily maximum 7.18 MGD of 90?F of non-contact cooling water, stormwater runoff and floor drainage

014: average flow of 27 MGD up to 90?F and daily maximum 45 MGD of 95?F of non-contact cooling water. (salt water)—this discharge is intermittent

018: average flow of 35.6 MGD up to 90?F and daily maximum 35.6 MGD of 95?F of non-contact cooling water. (salt water)—from power generation equipment, boiler blowdown and steam condensate.

019: average flow of 0.083 MGD up to 88.4?F and daily maximum not specified of 90?F of non-contact cooling water, steam condensate, floor drains, contact cooling water, boiler filter backwash, ion exchange regeneration and backwash, flash tank blowdown, and stormwater runoff from roof and yard drains.

020: average flow of 16.9 MGD with no temperature limit of unused circulating water from power generation, non-contact cooling water from rotor test, steam condensate, stormwater runoff from roof and yard drains. (salt water)

027: average flow of 0.3 MGD up to 85?F and daily maximum 0.83 MGD of 90?F of stormwater runoff from roof and yard drains, steam condensate, oil coolers, and floor drainage.

032: stormwater runoff from aircraft engine fuel storage area

*028: average flow of 0.0036 MGD up to 85?F and daily maximum 0.0048 MGD of 90?F of non-contact cooling water from industrial heat exchangers, stormwater runoff from roof and yard drains

*029: average flow of 28.8 MGD up to 90?F and daily maximum 54.7 MGD of 95?F of non-contact cooling water from steam turbine test equipment and heat exchangers (salt water) most likely intermittent.

*030: stormwater runoff from plant grounds

*031: average flow of 0.762 MGD up to 90?F and daily maximum 2.2 MGD of 90?F of non-contact cooling water from aircraft engine test cells, cooling tower blowdown from compressor cooling system, wash waters from aircraft engine test cells and stormwater runoff from plant grounds.

*Note: Outfalls 028, 029, 030, and 031 discharge into a small salt marsh channel that empties into the Saugus River.

MA0034045 Refuse Energy Systems Company (RESCO) Saugus Landfill discharges stormwater runoff into an unnamed tributary of the Pines River.

K2. Water Management Registrations and permits

Water Management Registrations and permits in the North Coastal Watersheds:

Registration # 31810701, Permit #9P31810701 for the Gloucester Department of Public Works, Gloucester. The Gloucester Department of Public Works is registered for withdrawal of 3.38 MGD and permitted for an additional 0.37MGD for a total of 3.77 MGD from seven surface water reservoirs.

Registration # 31816602 - Essex Country Club is registered to withdraw 0.1 MGD from the Essex Country Club reservoir.

Registration # 31803001 WMA Withdrawal for Emhart Industries.

Registration # 31822902 Eastman Gelatine Corporation is to withdraw 2.74 MGD from 12 wells and one surface water – Sidney's Pond. The facility is engaged in the manufacturing of photographic gelatin. The facility's water is supplied primarily from a wellfield located adjacent to the receiving water although city water is also available. Eastman Gelatine Corporation submitted a letter to DEP (dated 16 March 1999) which provided information to the DEP to complete the five-year review of their WMA Permit 9P318229.02. The letter (Gordon 1999) provided DEP with information regarding water conservation measures, stating that there has been a 29% decrease in water withdrawal rates between 1993 and 1998 (3.14 MGD to 2.2 MGD, respectively). The letter also indicated that their projected usage during the next five years would propel demand to approximately 4 MGD for the following reasons:

Co-Generation Project requiring approximately 0.8 MGD,

process for the Future Technology requiring approximately 0.5 MGD,

increased future production requiring 0.1 MGD,

gelatin recovery project requiring approximately 0.011 MGD, and

providing the City of Peabody water for a new municipal golf course requiring approximately 0.2 MGD.

Given the occurrence of "dry streambeds" in Goldthwaite Brook under their current operating conditions, requests for increased water withdrawals in the Goldthwaite Brook subwatershed merits careful consideration, even though these projected water-use estimates would be within the company's 5.0 MGD permitted water withdrawal volume.

Require a detailed accounting of Eastman Gelatine's water use and discharge operations (including a schematic of water supply/wastewater discharge and location). Review this current and projected budget in relation to their increase withdrawal on water quantity in Goldthwaite Brook. used at the facility. The water is used in the gelatin process and for barometric condenser cooling and electric generators. They are also permitted (#9P21822902) to withdraw an additional 2.26 MGD from a combination of their registered sources and a new well, for a total withdrawal volume of 5.0 MGD

Registration # 31822903 Peabody Water Department is to withdraw 1.9 MGD of surface-water from Spring Pond (in the Tapley Brook subwatershed). Since Peabody diverts water from the Ipswich River Basin into Spring Pond, the actual volume of water withdrawn from the Tapley Brook subwatershed is undetermined. The public water supply identification numbers (3229000-01 and –02) for their wells suggest that both are located in the Ipswich River watershed. The Zone II of these wells (GIS April 1998 DEP Approved Zone II data layer), however, extends into the headwater drainage area of Proctor Brook.

Registration # 31822901 Salem Country Club is to withdraw a total of 0.1 MGD from a tubular Well Field and an irrigation pond.

Registration # 3182580 Kearnwood Country Club is to withdraw 0.1 MGD from a groundwater source.

Registration # 31816302 Lynn Water and Sewer Commission is to withdraw 8.93 MGD and permitted (9P31816302) to withdraw an additional 1.28 MGD for a total withdrawal of 10.21 MGD from six sources. One of

the six sources is the Saugus River. The LWSC maintains and controls four ponds (Hawkes, Walden, Breeds and Birch) in the Hawkes Brook subwatershed for the purpose of supplying drinking water to the city of Lynn.

Permit #9P31816402 Colonial Sheraton Country Club, Lynnfield to withdraw 0.28 MGD from a pond.

Registration # 31816401 Lynnfield Center Water District is to withdraw 0.32 MGD from three wells.

Registration # 31830501 Wakefield Water Department is to withdraw 0.48 MGD from Crystal Lake.

Registration # 31816301 Carr Leather Company, Lynn is to withdraw 0.1 MGD from groundwater.

Appendix L: Relevant Government Agencies

It is fair to say that environmental protection became a "national priority" with the passage of the Federal Clean Waters Act (FWCA) PL 92-500 by Congress in 1972. The Federal Clean Waters Act stated objective *is "to restore and maintain the chemical, physical and biological integrity of the Nation's waters"* (Environmental Law Reporter 1988). The Act further required each State to develop information on the quality of its waters and report that information to the United States Environmental Protection Agency, Congress and the public.

Some of the relevant agencies and programs follow, along with definitions of terms and regulations.

Clean Water State Revolving Fund (CWSRF)

The multitude of conflicting and competing uses that we expect our waterbodies to address were identified as ***designated uses****. Designated uses include such things as Aquatic Life, Fish Consumption, Swimming, Drinking Water and aesthetic. The regulations therefore are targeted to ensuring each waterbody will meet minimum standards that are protective of its particular set of designated uses.*

Watershed Management plans

Watershed Management plans serve as the chief source of information in developing a priority ranking system to address these numerous problems.. The Act and subsequent revisions lay out in numbered sections the specific authorities granted. For example, in 1987 the Federal Water Quality Act replaced the EPA Construction Grants Program with the **Clean Water State Revolving Fund (CWSRF)** programs. Under this program municipalities, based on a priority ranking system, could submit pollution abatement projects that would be eligible to receive below market rate financing**.**

National Pollution Discharge Elimination System (NPDES)

The **National Pollution Discharge Elimination System (NPDES)** is a permitting system dedicated to the reduction of pollution sources emanating from discrete sources such as from an industry or municipal wastewater treatment plant. Such sources are frequently referred to as "Point Source Discharges." Under this jointly administered program, all facilities which discharge pollutants from any point source into waters of the Commonwealth are required to obtain a NPDES permit. More recently water quality regulators have placed additional focus on nonpoint pollution. Nonpoint pollution is broadly defined as the pollution caused by diffuse sources that are not presently regulated as point sources and are normally associated with precipitation and runoff from the land or percolation. Within the past year the EPA has begun the process of addressing the problem of stormwater contamination. Under the authority of Section 402(p) of the Clean Waters Act small cities and towns located in urbanized areas will be required receive a permit to discharge stormwater and to develop and implement a stormwater management program. The permits will by administered as Phase II Stormwater Compliance of the NPDES program. These drainage systems are referenced as "municipal separate storm sewer systems" or MS4's. Communities are slated to submit their respective plans in March of 2003.

Section 303d: impaired waterbodies

Section 305b of the FCWA provides the legal authority by which each state must develop information on the quality of its waters and report that information to the Environmental Protection Agency and Congress. **Section 303d** addresses **impaired waterbodies.** Impaired waterbodies such as lakes, rivers, ponds, estuaries and harbors that do not meet water quality standards set for their ***designated uses*** in spite of the imposition of technology based pollution control practices. Waterbodies on the 303d list are to receive priority status in addressing the sources of impairment and bringing the waterbody into compliance with water quality standards.

One such methodology is to develop a pollution budget called the **Total Maximum Daily Load** (TMDLs) on the sources of pollution causing the degradation and a Remediation Plan for each pollutant of concern. **Section 319** deals with implementation practices designed to reduce nonpoint pollution sources. Some sections of the Clean Water Act such as 604b, 319, 104b in addition provide funding mechanisms to address or remediate the various

sources of pollution. The Massachusetts Department of Environmental Protection currently administers a number of these grant and loan programs provided through the auspices of the EPA. Additional program funds are derived through other state or federal appropriations such as through an Environmental Bond Fund.

FEMA Federal Emergency Management Agency

The National Flood Insurance Act of 1968 and Flood Disaster Program Act of 1973 provided the source of authority to conduct Flood Insurance Studies to investigate the existence and severity of flood hazards in communities across the nation.

CZMA Coastal Zone Management Act.

The Coastal Zone Management Act of 1972 and through subsequent amendments and reauthorizations established a program for the States and territories to develop comprehensive programs to protect and manage coastal resources. Resource management and protection is accomplished through State Laws regulations, permits, and local plans and zoning ordinances. In 1990 **section 6217 of the Coastal Zone Act Reauthorization Amendments** provided comprehensive guidance to the coastal States on the types of management measures needed to specifically address nonpoint pollution sources affecting coastal water quality and establishes the Coastal Nonpoint Pollution Control Program. …*"The purpose of the program "shall be to develop and implement management measures for nonpoint pollution to restore and protect coastal waters, working in close conjunction with other State, Federal and local authorities." " There is clear link between coastal water quality and land use activities along the shore." (USEPA Proposed Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters may 1991).*

MEPA Massachusetts Environmental Policy Act

Massachusetts General Law Chapter 30 section 62 the current statute was enacted in 1977. The statute requires that all agencies of the Commonwealth determine the impact on the natural environment of all works, projects directly undertaken by state agencies and to private projects for which state permits are sought or in which state funding or land transfer is involved and use all practicable means and measures to avoid or minimize the environmental harm that has been identified. It also provides the procedure--the Environmental Impact Report--by which that obligation will be satisfied and authorizes the Secretary of Environmental Affairs to oversee the review process. MEPA does not apply to projects needing just local approvals.

WMA Massachusetts Water Management Act

Massachusetts General Laws Chapter 21G section 3 and General Law Chapter 30A sections 2 and 3. Regulation 310 CMR 36.00 is intended to establish a program whereby withdrawals of water in the Commonwealth above a threshold quantity are registered and regulated by the Department of Environmental Protection, Division of Drinking Water. These regulations are intended to enable the Department to document baseline water use in the Commonwealth and begin the process of comprehensive management of the surface and groundwater of the Commonwealth.

State Sanitary Code

(105 CMR- 445.000) requires that the water at public bathing beaches be tested for bacteria to protect the public from contracting infectious diseases while swimming. Local health departments or local organizations collect the vast majority of beach water quality testing.

Title V, Department of Environmental Protection

310 CMR 479 - 310 CMR 15.000: of the State Environmental Code, Title 5: are the standard requirements for the siting, construction, inspection, upgrade and expansion of on-site sewage treatment and disposal systems and for the transport and disposal of septage (DEP 2000b).

Oil and Hazardous Material Release Prevention Act (MGL 21E)

Pursuant to the Massachusetts Contingency Plan (MCP), a 21E site is "any building, structure, installation, equipment, pipe or pipeline, including any pipe discharging into a sewer or publicly-owned treatment works, well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft, or any other place or area where oil or hazardous material has been deposited, stored, disposed of or placed, or otherwise come to be located. A complete listing of statewide 21E sites can be accessed through the DEP World Wide Web site (http://www.state.ma.us/dep/bwsc/sitelist.htm).

Executive Office of Environmental Affairs

The environmental agencies in the Commonwealth of Massachusetts are organized under the Executive Office of Environmental Affairs, a cabinet level secretariat reporting directly to the Governor. Secretary Bob Durand is charged with managing the Commonwealth's environmental policy and overseeing implementation of the state's environmental laws and regulations. He is focusing his efforts on strengthening the Watershed Initiative to empower communities to plan sustainable futures and to broaden the Initiative to protect the natural biodiversity of the state.

The Secretary oversees five major environmental agencies and six independent programs that have the responsibility for carrying out the state environmental programs and enforcing state environmental laws. For more detailed information regarding the environmental agencies and programs administered under EOEA please consult the web page http://www.mass.gov/portal/index.jsp and related linkages.

Descriptions of the five environmental agencies follow.

Department of Environmental Protection

Bureau of Resource Protection (BRP) is responsible for identifying critical inland and coastal water resources, devising strategies for protecting and preserving them, safeguarding public drinking water supplies and ensuring public access to the waterfront. BRP also administers grants and revolving loan programs that help the Commonwealth's cities, towns, municipal water or sewer districts and other regional entities improve their environmental infrastructure. BRP consists of the following divisions: Watershed Management Division, Municipal Services Division, Planning and Program Support. The Watershed Management Division, charged with monitoring and regulatory activities that affect water quality and quantity within the state's major river basins, combines the four water resource programs within the original BRP (Wetlands and Waterways, Water Pollution Control, Watershed Management, and Drinking Water) and focuses on building local and regional coalitions to bring about the next major increment of water quality improvement. The Municipal Services Division, replaces the former Bureau of Municipal Facilities, has responsibility for administering the wastewater and drinking water State Revolving Funds and delivers training and technical assistance to Massachusetts towns and cities, wastewater treatment plant operators, septic system inspectors and soil evaluators. Planning and Program Support is the administrative backbone of BRP, collecting and analyzing ecosystem, facility and public health data to measure the effectiveness of the bureau's initiatives and programs, and striving for continuous improvement measured not only by environmental indicators but also in the variety and quality of services provided to municipal officials

Bureau of Waste Prevention (BWP) is charged with preventing pollution before it happens and promoting maximum reuse and recycling of residential, institutional and industrial waste. BWP consists of the following divisions: Business Compliance Division

Consumer and Transportation Compliance Division, Evaluation and Planning Division Program Support. Bureau of Waste Site Cleanup (BWSC) is charged and ensuring immediate and effective response to environmental emergencies, such as oil spills and chemical fires, as well as timely assessment and cleanup of hazardous waste sites by private parties responsible for them. BWSC consists of the following divisions: Policy and Program Development Division, Response and Remediation Division Technical and Financial Support Division. DEP has four Regional Offices that are the focal point for most of DEP's permitting, compliance, enforcement, emergency response and site cleanup activity that protects citizens of Massachusetts and their environment on the local level. Staff based in these offices spends most of their time in the field and are very familiar with the businesses and communities they regulate.

Department of Environmental Management

Owns and operates the state forest and parks system, which is one the largest in the nation. In addition, the Department is responsible for water resources planning, dam safety, lake and pond restoration, hazard mitigation planning, areas of critical environmental concern planning, and forestry management. Amongst the key DCR (DEM) programs is The Areas of Critical Environmental Concern (ACEC) Program established in 1975. It authorizes the Secretary of Environmental Affairs to identify and designate "areas of critical environmental concern" to the Commonwealth. The ACEC regulations direct the EOEA agencies to take actions to preserve, restore, and enhance the natural resources using existing state environmental regulatory and review framework. DCR (DEM) offers a valuable service to municipalities, non-profit organizations and planning agencies by funding and supporting grant programs. The funding provided supports worthwhile projects that might not be able to be completed otherwise. Please consult the Department of Environmental Management's Website http://www.state.ma.us/dem for complete list of program and activities.

Massachusetts Department of Agricultural Resources (MDAR)

(Formerly known as the Department of Food and Agriculture, DFA)

Supports agriculture industry through market development and regulates certain related activities, including pesticide use. The Department also manages the state agriculture land preservation program and coordinates with federal agencies on mitigating agriculture impacts to water resources.

Department of Fish and Game (DFG)

(Formerly known as the Department of Fisheries and Wildlife Environmental Law Enforcement, DFWELE)

Responsible for managing game and non-game wildlife and the regulation of hunting and fishing. The Department manages the state's rare and endangered species program and administers the Riverways Program. The mission of the Riverways Program is to promote the restoration and protection of the ecological integrity of the Commonwealth's watersheds: rivers, streams and adjacent lands. The Riverways Program was established within DFWELE in 1987 in recognition that river and stream corridors are a crucial component of the state's ecological infrastructure and that protection of these watershed resources could not be accomplished through land acquisition alone. The Natural Heritage & Endangered Species Program (NHESP), part of the Massachusetts Division of Fisheries and Wildlife http://www.mass.gov/dfwele/dfw/ is one of the Programs forming the Natural Heritage Network. NHESP is responsible for the conservation and protection of hundreds of species that are not hunted, fished, trapped, or commercially harvested in the state. The program's highest priority is protecting the approximately 175 species of vertebrate and invertebrate animals and 250 species of native plants that are officially listed as endangered, threatened or of special concern in Massachusetts.

Other agencies within DFWELE include the Division of Marine Fisheries who's' mission is to manage, develop, and protect the renewable living marine resources to provide the greatest public benefit. The Division fosters protection of the marine environment by cooperating with other state and federal agencies on pollution abatement, coastal wetlands protection and other programs concerning coastal waters and marine life. The Division monitors coastal contaminant levels in fish and shellfish, operates a shellfish purification facility, and evaluates the impacts of coastal development on marine fish and their habitats.

Department of Conservation and Recreation (DCR)

(Formerly known as the Metropolitan District Commission, MDC)

This system was the first regional organization of public open space in the United States. It is internationally recognized as a model for multi-jurisdictional park systems and designed to encourage public appreciation of open space. It was created in 1893 to oversee 19,000 acres a network of Boston area parks, parkways, recreation facilities and flood control structures. The Commission resulted from the efforts of Charles Eliot, son of a Harvard University president, and Sylvester Baxter, a Malden resident who wrote for the Boston Daily Advertiser. Baxter and Eliot based their design on the influences and planning theories of America's first generation of landscape architects, including Frederick Law Olmsted, H.W.S. Cleveland and Robert Morris Copeland. Within the North Coastal Watersheds are two of the largest parklands Breakheart and Rumney Marsh Reservations. As a whole, the Metropolitan Park System is currently eligible for listing on the National Register of

Historic Places. The DCR (MDC) also conducts routine testing for fecal coliform and enterococcus bacteria of their recreational beaches during the summer months

Independent Programs

The Massachusetts Watershed Initiative

- Begun in 1996 by the Executive Office of Environmental Affairs. The Watershed Initiative was an innovative, result-oriented program. The Massachusetts Watershed Initiative was a broad partnership of state and federal agencies, conservation organizations, businesses, municipal officials and individuals. The goal of the Massachusetts Watershed Initiative was to integrate the activities of the state environmental programs with each other and with the activities of federal and local governments, non-governmental organizations, business and other watershed partners along seven program elements Outreach and Education, Local Capacity Building, Water Quality, Water Quantity, Habitat, Open Space, and Recreation.

MEPA Unit

- Implements the Massachusetts Environmental Policy Act (MEPA) Regulations 301 CMR 11.00 Statute M.G.L c30, ss 61-62H. The North Coastal Watersheds team has successfully utilized this program to advocate for stronger environmental protection measures consistent with the long-term goals of the North Coastal Watersheds.

Coastal Zone Management

– Implements state coastal protection policies and programs, including providing consistency review of federal actions in the coastal zone and implementation of related grant and regulatory programs. The mission of Massachusetts Office of Coastal Zone Management (MCZM) is to balance the impact of human activities with the protection of coastal and marine resources through planning, public involvement, education, research, and sound resource management. CZM helps communities with harbor planning, monitoring, some wastewater issues, and stormwater as well as wetland and tideland issues. MCZM also serves as a conduit for grants to communities and organizations to remediate nonpoint pollution sources. MCZM's programs rely on existing Massachusetts' environmental regulations and statutes for their authority.

Division of Conservation Services

- Since 1964, the Division of Conservation Services has been providing technical and financial assistance to farmers as well as public and private landowners in matters dealing with farm plans or sediment and erosion control. DCS awards grants to municipalities for conservation and parkland acquisition and construction. DCS also provides assistance with the development of open space and recreation plans, and to municipalities, land trusts, and private landowners regarding approval of conservation restrictions. The Self-Help program was established in 1961 to assist municipal conservation commissions acquiring land for natural resource and passive outdoor recreation purposes. Lands acquired may include wildlife, habitat, trails, unique natural, historic or cultural resources, water resources, forest, and farmland. Compatible passive outdoor recreational uses such as hiking, fishing, hunting, cross-country skiing, bird observation and the like are encouraged. Access by the general public is required. This state program pays for the acquisition of land, or a partial interest (such as a conservation restriction), and associated acquisition costs such as appraisal reports and closing costs.

The Urban Self-Help Program was established in 1977 to assist cities and towns in acquiring and developing land for park and outdoor recreation purposes. Any town with a population of 35,000 or more year-round residents, or any city regardless of size, that has an authorized park /recreation commission and conservation commission, is eligible to participate in the program. Communities that do not meet the population criteria listed above may still qualify under the "small town," "regional," or "statewide" project provisions of the program.

Office of Technical Assistance

- Provides assistance to public and private entities on the pollution prevention and toxic use reduction.

Water Resources Commission

– The Water Resources Commission (WRC) is a 13 member Commission within EOEA responsible for developing the water resources management framework under which the environmental agencies operate. The Commission is also responsible for implementing the Interbasin Transfer Act, which regulates the transfer of all surface and groundwater, including wastewater, between the 27 major watersheds in the Commonwealth. For more information about the WRC, state water policies and the Interbasin Transfer Act please visit the Department of Environmental Management's Website http://www.state.ma.us/dem **.**

Wetlands Restoration Program

The Massachusetts Wetlands Restoration Program (MWRP) was established in 1994 within the Executive Office of Environmental Affairs(EOEA, website at http://www.state.ma.us/envir/) to implement a voluntary (non-regulatory) program for restoring the Commonwealth's wetlands. MWRP inventories wetlands restoration sites within watersheds and coastal regions, and facilitates the implementation of priority restoration projects through its GROWetlands (Groups Restoring Our Wetlands) Initiative. Once a restoration project is accepted into the program, MWRP, in collaboration with its many federal, corporate, and non-profit partners, works with the project sponsor to provide or obtain whatever assistance – financial, technical, monitoring or other support - is required to complete the project.

The Corporate Wetlands Restoration Partnership (CWRP) was launched in May of 1999 by the Massachusetts Executive Office of Environmental Affairs (EOEA), The Gillette Company, and the federal EPA, and is managed by EOEA's Wetlands Restoration Program. This partnership was the first of its kind in the nation to encourage voluntary corporate participation in proactive wetlands restoration. CWRP attracts funding and assistance from the private sector to help complete MWRP's Wetlands restoration efforts

Appendix M: Potential Buildout Statistics

Table Summary of potential buildout statistics for North Coastal Watersheds Communities

Community	Additional Developable Acres	Additional Population	Additional Residential Units	Additional Commercial Industrial Floor Space (sq. ft)	Additional Water Demand (gallons per day)
Beverly	2,112	4,805	2,054	7,219,391	842,289
Danvers	1,543	3,593	1,443	6,877,850	785,277
Essex	4,360	8,286	5,698	5,663,721	1,446,231
Gloucester	3,737	9,709	4,046	15,863,687	1,917,985
Lynn	724	10,133	4,239	8,048,209	1,363,564
Lynnfield	515	1,137	442	748,382	141,419
Malden	255	5,136	2,307	1,104,032	469,048
Manchester	1,636	3,389	1,448	1,962,538	401,392
Marblehead	110	594	261	-	44,517
Melrose	177	3,349	1,419	545,952	292,148
Nahant	20	117	45	-	8,746
Peabody	1,649	7,600	3,040	6,379,513	1,048,434
Reading	727	2,050	771	-	153,769
Revere	258	5,276	2,748	3,710,826	674,010
Rockport	1,431	7,342	3,530	-	550,668
Salem	893	2,747	1,205	4,360,986	533,112
Salisbury	2,401	3,026	1,125	5,833,555	664,480
Saugus	860	2,006	781	9,862,103	890,137
Swampscott	319	1,527	636	981,901	188,160
Wakefield	378	2,669	1,072	207,711	215,762
Totals	**24,105**	**84,491**	**38,300**	**75,659,531**	**12,632,148**

Appendix N: MAPC Survey

The Boston Metropolitan Area Planning Council survey is referred to as "MAPC survey." The MAPC area includes 101 towns with overlap to NCW. The MAPC survey was conducted on-line within NCW via the *Salem News* and the *Gloucester Times*. The partial survey results were downloaded as of May 20, 2004, prior to survey completion, to meet publication deadlines for this report. 767 people responded from NCW towns. The author compiled the results, by collating partial survey results for each NCW town.

MAPC Survey	*NCW Total*	Beverly	Danvers	Essex	Gloucester	Manchester	Marblehead	Peabody	Rockport	Salem	Swamp-scott
1) Thinking about the city or town in which you live, has the quality of life gotten better, gotten worse or stayed the same over the past three years?											
Better	*21%*	37%	12%	11%	14%	8%	9%	9%	11%	34%	4%
Worse	*46%*	34%	46%	63%	51%	77%	45%	57%	47%	36%	78%
Same	*33%*	29%	42%	26%	35%	15%	45%	34%	42%	29%	19%
2a) What do you think are the two most important problems facing your community today? First most important:											
Development/ Sprawl	*26%*	29%	29%	42%	36%	46%	23%	29%	17%	11%	22%
Traffic	*12%*	9%	11%	0%	5%	15%	0%	17%	3%	23%	11%
Crime	*4%*	4%	6%	0%	4%	0%	0%	3%	3%	8%	0%
The Economy	*8%*	8%	0%	0%	15%	0%	9%	6%	6%	7%	4%
Education/ Schools	*15%*	18%	14%	32%	13%	23%	5%	17%	8%	16%	19%
Environment	*5%*	6%	2%	0%	3%	8%	5%	1%	0%	9%	7%
Water	*3%*	0%	11%	0%	1%	0%	5%	0%	33%	1%	0%
Housing	*9%*	10%	5%	0%	16%	0%	14%	4%	22%	6%	0%
Taxes	*17%*	15%	22%	21%	9%	8%	41%	23%	8%	20%	37%
Other	*1%*	0%	2%	5%	1%	0%	0%	0%	0%	1%	0%
2b) What do you think are the two most important problems facing your community today? 2nd most important:											
Development/ Sprawl	*16%*	12%	12%	47%	20%	23%	23%	21%	14%	9%	22%
Traffic	*19%*	18%	22%	5%	11%	15%	0%	31%	11%	25%	19%
Crime	*5%*	8%	2%	0%	6%	0%	0%	4%	6%	5%	0%
The Economy	*8%*	10%	3%	0%	11%	8%	9%	8%	3%	10%	0%
Education/ Schools	*12%*	9%	14%	21%	11%	15%	14%	9%	11%	14%	19%
Environment	*12%*	16%	8%	16%	11%	31%	14%	12%	8%	11%	26%
Water	*5%*	8%	15%	0%	3%	0%	5%	3%	22%	3%	0%
Housing	*9%*	10%	8%	5%	12%	0%	23%	4%	14%	7%	0%
Taxes	*12%*	8%	14%	5%	15%	8%	14%	9%	8%	15%	11%
Other	*2%*	2%	3%	0%	2%	0%	0%	0%	3%	2%	4%

MAPC Survey	NCW Total	Beverly	Danvers	Essex	Gloucester	Manchester	Marblehead	Peabody	Rockport	Salem	Swampscott
2c) What do you think are the two most important problems facing your community today? (1st OR 2nd most important - arithmetic sum, so total is 200%):											
Development/ Sprawl	42%	41%	42%	89%	56%	69%	45%	49%	31%	19%	44%
Traffic	30.1%	28%	32%	5%	16%	31%	0%	48%	14%	48%	30%
Crime	9%	12%	8%	0%	9%	0%	0%	6%	8%	13%	0%
The Economy	17%	18%	3%	0%	26%	8%	18%	14%	8%	17%	4%
Education/ Schools	27%	28%	28%	53%	24%	38%	18%	26%	19%	29%	37%
Environment	17%	22%	9%	16%	13%	38%	18%	13%	8%	19%	33%
Water	8%	8%	26%	0%	3%	0%	9%	3%	56%	3%	0%
Housing	18%	20%	12%	5%	28%	0%	36%	8%	36%	13%	0%
Taxes	29.6%	23%	35%	26%	24%	15%	55%	32%	17%	35%	48%
Other	2%	2%	5%	5%	2%	0%	0%	0%	3%	3%	4%
3a) What do you think are the two most important problems facing the Boston metropolitan area today? 1st most important:											
Development/ Sprawl	23%	30%	22%	58%	21%	62%	14%	29%	19%	15%	19%
Traffic	16%	8%	29%	0%	13%	15%	14%	18%	31%	18%	4%
Crime	10%	11%	6%	5%	14%	0%	0%	10%	6%	11%	4%
The Economy	16%	14%	18%	16%	19%	15%	23%	12%	6%	12%	44%
Education/ Schools	9%	8%	9%	0%	11%	0%	14%	12%	8%	9%	4%
Environment	3%	3%	0%	0%	3%	0%	9%	0%	0%	6%	4%
Water	1%	1%	0%	0%	0%	0%	0%	4%	0%	2%	0%
Housing	13%	18%	5%	11%	11%	8%	14%	9%	22%	16%	4%
Taxes	9%	8%	9%	11%	8%	0%	14%	6%	8%	9%	19%
Other	1%	1%	2%	0%	0%	0%	0%	0%	0%	1%	0%
3b) What do you think are the two most important problems facing the Boston metropolitan area today? 2nd most important:											
Development/ Sprawl	14%	13%	12%	32%	14%	38%	9%	13%	8%	14%	7%
Traffic	17%	10%	17%	16%	23%	8%	23%	13%	17%	17%	15%
Crime	9%	6%	6%	11%	7%	0%	9%	8%	25%	12%	7%
The Economy	11%	17%	12%	16%	6%	0%	9%	18%	6%	11%	7%
Education/ Schools	10%	6%	12%	11%	15%	8%	14%	5%	8%	11%	7%
Environment	11%	13%	9%	5%	9%	31%	14%	14%	14%	9%	7%
Water	3%	5%	3%	0%	2%	0%	5%	4%	0%	4%	4%
Housing	13%	15%	11%	0%	15%	8%	14%	14%	14%	11%	15%
Taxes	11%	13%	14%	11%	9%	8%	5%	10%	8%	10%	30%
Other	1%	2%	3%	0%	1%	0%	0%	0%	0%	2%	0%

MAPC Survey	NCW Total	Beverly	Danvers	Essex	Gloucester	Manchester	Marblehead	Peabody	Rockport	Salem	Swamp-scott
3c) What do you think are the two most important problems facing the Boston metropolitan area today? (1st OR 2nd most important - arithmetic sum, total is 200%):											
Development/ Sprawl	*37%*	43%	34%	89%	35%	100%	23%	42%	28%	29%	26%
Traffic	*32%*	18%	46%	16%	36%	23%	36%	31%	47%	35%	19%
Crime	*19%*	17%	12%	16%	21%	0%	9%	18%	31%	22%	11%
The Economy	*27%*	31%	31%	32%	25%	15%	32%	30%	11%	23%	52%
Education/ Schools	*20%*	14%	22%	11%	26%	8%	27%	17%	17%	21%	11%
Environment	*14%*	16%	9%	5%	12%	31%	23%	14%	14%	16%	11%
Water	*4%*	6%	3%	0%	2%	0%	5%	8%	0%	5%	4%
Housing	*26%*	33%	15%	11%	26%	15%	27%	23%	36%	27%	19%
Taxes	*20%*	21%	23%	21%	17%	8%	18%	17%	17%	19%	48%
Other	*2%*	3%	5%	0%	1%	0%	0%	0%	0%	3%	0%
4) How about traffic? In your city or town is traffic a very serious problem, a somewhat serious problem, not a very serious problem or no problem at all.											
Very serious	*32%*	28%	38%	26%	13%	23%	14%	55%	22%	47%	44%
Somewhat serious	*42%*	45%	40%	16%	47%	62%	36%	42%	17%	42%	44%
Not very serious	*21%*	27%	14%	37%	32%	0%	36%	3%	47%	10%	11%
No problem at all	*0%*	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Not sure	*0%*	0%	3%	0%	1%	0%	0%	0%	0%	0%	0%
5) What concerns you about development in your city or town?											
Not enough development	*9%*	11%	5%	0%	10%	15%	5%	3%	11%	12%	4%
Too much development	*44%*	45%	60%	58%	52%	54%	32%	66%	39%	23%	26%
Too dense	*9%*	10%	6%	0%	6%	0%	32%	5%	8%	12%	30%
Not enough density	*2%*	7%	0%	0%	1%	0%	0%	1%	0%	4%	0%
Unwanted type of development	*15%*	9%	6%	16%	12%	0%	9%	8%	17%	27%	30%
Poor location	*4%*	3%	3%	5%	5%	0%	5%	5%	6%	4%	7%
Impact	*16%*	16%	20%	21%	14%	31%	18%	12%	19%	19%	4%
6) How important do you think it is for your city or town to have homes, stores, and services within walking distance of each other?											
Very important	*37%*	43%	28%	21%	21%	38%	64%	34%	39%	56%	19%
Important	*20%*	22%	14%	11%	20%	31%	14%	13%	22%	23%	19%
Somewhat important	*26%*	25%	35%	26%	35%	8%	14%	39%	17%	15%	15%
Not very important	*13%*	8%	18%	26%	17%	0%	9%	12%	19%	5%	41%
Not at all important	*4%*	3%	5%	16%	7%	23%	0%	3%	3%	1%	7%
7) How important do you think it is for you to have access to public transportation in your city or town?											
Very important	*47%*	53%	28%	16%	32%	62%	64%	52%	39%	67%	37%
Important	*23%*	25%	25%	32%	23%	8%	14%	17%	22%	20%	44%
Somewhat important	*20%*	14%	29%	32%	33%	0%	14%	18%	22%	8%	15%
Not very important	*7%*	5%	11%	11%	10%	15%	9%	10%	11%	3%	4%
Not at all important	*3%*	3%	8%	11%	2%	15%	0%	3%	6%	2%	0%

MAPC Survey	*NCW Total*	Beverly	Danvers	Essex	Gloucester	Manchester	Marblehead	Peabody	Rockport	Salem	Swamp-scott
8) Which statement do you most agree with?											
Local government should continue to plan for and encourage growth and development in all areas.	*26%*	33%	23%	5%	24%	8%	27%	13%	22%	38%	11%
Local government should try to limit growth in less-developed areas and encourage growth only in areas that are already built up.	*74%*	68%	77%	95%	76%	92%	73%	87%	78%	62%	89%
9) Which statement do you most agree with?											
I think that increased coordination among cities and towns within the metropolitan region could help lower costs and solve problems.	*70%*	74%	65%	53%	61%	77%	68%	70%	61%	81%	85%
I think that regional solutions won't work and would require my city or town to give up too much local control.	*30%*	26%	35%	47%	39%	23%	32%	30%	39%	19%	15%
10) Please read the list below of things that city and town governments do. Do you think that these issues should be decided locally, that is by each city and town exclusively, or do you think these issues should be decided regionally by a group of cities and towns? (Number indicating "Regional" over "Local")											
Housing	*28%*	38%	35%	37%	18%	54%	36%	31%	19%	26%	37%
Transportation	*81%*	85%	85%	68%	73%	85%	73%	83%	72%	86%	96%
Air quality	*88%*	90%	85%	84%	88%	100%	68%	88%	92%	88%	85%
Water quality and supply	*62%*	73%	65%	53%	42%	62%	45%	60%	47%	77%	85%
Public safety: fire, police, emergency medical	*35%*	41%	40%	58%	24%	77%	41%	31%	33%	35%	56%
Education	*36%*	35%	37%	47%	40%	69%	23%	30%	36%	29%	70%
Economic development/job growth	*67%*	67%	78%	53%	60%	100%	59%	70%	61%	67%	93%
Land Use/ zoning	*25%*	26%	37%	32%	19%	54%	27%	29%	17%	20%	41%
Number of respondents	***767***	**120**	**65**	**19**	**198**	**13**	**22**	**77**	**36**	**190**	**27**

Appendix O: Bibliography

The documents cited in this bibliography are all available from the North Coastal Watershed Team representative, either via Jim Comeau or Jesse Gordon. Most are also available on-line at http://www.northcoastal.net/ncw/Docs/, which also includes some items not listed here. Those that are listed in both have their URL (downloadable object name) listed at the end of the Source column.

Title	Date	Source / URL
1998 Recreation & Open Space Plan: City of Peabody	Aug 2, 1999	Department of Community Development & Planning
BioMap: Guiding land conservation for biodiversity in Massachusetts	Jan 1, 2001	Natural Heritage & Endangered Species Program-Massachusetts Division of Fisheries and Wildlife
Building Vibrant Communities: Linking Housing, Economic Development, Transportation, and the Environment	Mar 29, 2001	Executive Office of Environmental Affairs
Building Vibrant Communities: Linking Housing, Economic Development, Transportation, & the Environment (Lynn MA)	Mar 29, 2001	Executive Office of Environmental Affairs
Cape Ann Water Supply Protection Plan: Volume I: Appendices	May 1, 1994	Metropolitan Area Planning Council Boston, MA
Cape Ann Water Supply Protection Plan: (Gloucester and Rockport) Volume I: Text	May 1, 1994	Metropolitan Area Planning Council Boston, MA
Catalog of Federal Funding Sources for Watershed Protection	Sep 1, 1997	Assessment and Watershed Protection Division Office of Wetland, Oceans and Watersheds U.S. EPA Washington, DC
Chebacco Lake Diagnostic Report (2 Final and 1 Draft versions)	Dec 30, 1998	Salem State College & Mass Department of Environmental Management
Chubb Brook Drainage Improvements: Final Environmental Impact Report EOEA #11980 (Beverly, MA)	Nov 15, 2001	Camp Dresser & McKee Inc. Cambridge, MA
City of Gloucester Comprehensive River and Stream Habitat Restoration Report	Jan 1, 2003	Mass Audubon
City of Gloucester Industrial Pretreatment Program: Annual Report 1988		
City of Revere Flood Management Plan: December 2000	Apr 4, 2001	Flood Hazard Planning Team, Revere MA
Coastal Flood Risk Reduction Plan: Saugus River and Tributaries-Final Draft Feasibility Report	Jun 30, 1995	Department of Civil and Environmental Engineering, Rutgers University
Commonwealth of Massachusetts: Summary of Water Quality 2000	Jul 1, 2000	MA Department of Environmental Protection Division of Watershed Management Worcester, MA
Conservation Implications of Climate Change: Soil Erosion and Runoff from Cropland	Jan 30, 2003	Soil and Water Conservation Society Climate_change-final.pdf
Creating Greenways: A Citizen's Guide	Feb 4, 2000	Mass Department of Environmental Management Greenways Program
DEM Office of Dam Safety Lake Quannapowitt 1999 Report	Oct 12, 2000	Haley & Aldrich, Inc.

Draft: Combined Sewer Overflow Revised Long-Term Control Plan Gloucester, MA	Apr 30, 2001	Metcalf & Eddy Wakefield, MA
Draft-Environmental Impact Report: Reedy Meadow Flood Control Dredging Project EOEA #11167 (Lynnfield & Wakefield)	Apr 30, 1999	Normandeau Associates Plymouth, MA
Dredged Material Management Plan EOEA # 11534: Draft Environmental Impact Report Gloucester, MA	Oct 30, 2000	Maguire Group Inc., Foxboro, MA
East Lynn Combined Sewer Overflow Abatement System: Project Evaluation Form	Jun 30, 1999	Malcolm Pirnie, Inc.
Estuaries Volume 24, Number 6A-December 2001	Dec 1, 2001	Estuarine Research Federation Lawrence, KS
Estuaries Volume 24, Number 6B-December 2001	Dec 1, 2001	Estuarine Research Federation Lawrence, KS
Fate and Transport oMideling of Contaminants in Salem Sound: Draft Final Report	Jun 30, 2001	Applied Science Associates, Inc. Narragansett, RI
Final Environmental Impact Report EOEA #12291 Griswold Pond Aquatic Plant Management Saugus, MA	Mar 27, 2001	Lycott Environmental, Inc. Southbridge, MA
Final Environmental Impact/4(f) Statement: Connector Road and Bridge (Peabody, Salem, Beverly)	Jun 8, 1981	H.W. Lochner, Inc.
Final Report: Water Quality Testing MDC Recreational Waters 2000 Beach Testing	Nov 30, 2000	G & L Laboratories Quincy, MA
Flood Hazard Mitigation Plan: City of Peabody	Apr 18, 1981	Department of Community Development & Planning, Dept. of Public Services
Gloucester 301(h) Monitoring Program: 1998 Annual Report	Apr 25, 2000	Gloucester Department of Public Works
Ground Water and Surface Water: A Single Resource	Jan 1, 1998	U.S. Geological Survey Denver, CO
How you can help your community to grow smart: A guide for New England Community Officials	Nov 30, 2000	EPA New England EPANewEnglandsprawlguide.pdf
Hydrologic and Hydraulic Analysis: Wetlands Restoration Investigation-Ballard Street Salt Marsh - Saugus, MA	Mar 1, 1999	US Department of Agriculture Natural Resources Conservation Service Amherst, MA
Impacts of Human Manipulation on Streamflows in the Saugus River	May 2, 2000	Gomez and Sullivan Engineers and Environmental Scientists Weare, NH
Ipswich River Watershed Management Plan	Jan 1, 2003	Ipswich River Watershed Association
Ipswich/North Coastal Water Supply Protection Plan (Danvers, Middleton, Peabody, and Topsfield) Vol. I: Text	Aug 1, 1994	Metropolitan Area Planning Council Boston, MA
Ipswich/North Coastal Water Supply Protection Plan (Danvers, Middleton, Peabody, and Topsfield) Vol. II: Appendices	Aug 1, 1994	Metropolitan Area Planning Council Boston, MA
Lake Quannapowitt Data Review March 2000	Mar 15, 2000	ENSR Northborough, MA
Lawrence Street Brook Drainage Improvements (Beverly, MA)	Jul 15, 1999	Camp Dresser & McKee Inc. Cambridge, MA

Looking to the Future: An Action Plan for the Protection of the Saugus River	Sep 17, 1991	Robin Snyder
Lynn Water and Sewer Commission: Summer and Cottage Street Combined Sewer Separation Project Contract SS-8	Jul 31, 1998	Camp Dresser & McKee Inc. Cambridge, MA
MA Town Census	Aug 21, 2003	Census_MA_Towns.xls
Mass Bays Program: Companion Guidelines for FecaLOAD (with disk)	post-1996	Horsley & Witten, Inc. Environmental Services
Massachusetts Department of Environmental Protection: Massachusetts Watershed Initiative Program Indicative Project Summaries 1999-2002	Nov 1, 2001	Mass. Department of Environmental Protection Worcester, MA
Massachusetts Department of Environmental Protection: Selected Federal and State Grant Funded Indicative Project Summaries FFY 1996-2000	Jan 15, 2000	Mass. Department of Environmental Protection Worcester, MA
Massachusetts Watershed Initiative: FY 2001 Team Workplans	Feb 23, 2000	Executive Office of Environmental Affairs
Massachusetts Watershed Initiative: Stormwater Compliance Phase II Contract 01-09/MWI (w/ Appdx D)	Dec 12, 2001	Vanasse Hangen Brustlin, Inc Watertown, MA
Massachusetts Year 2002 Integrated List of Waters: Part 2-Final Listing of Individual Categories of Waters	Sep 30, 2003	Executive Office of Environmental Affairs Division of Watershed Management 303_list.pdf
Master Plan: Downtown Riverwalk & Leather City Historic Trail-City of Peabody	Apr 13, 2001	Department of Community Development & Planning
North Coastal Alliance Water Quality Assessment: Final Report	Jun 30, 2000	Salem Sound 2000, Inc.
North Coastal Watershed 1997/1998 Water Quality Assessment Report	May 30, 2000	Department of Environmental Protection, Division of Watershed Management
North Coastal Watershed 5yr Plan: Draft	Sep 30, 2003	NCW_5_yr_Plan_Draft_Sept_30_2003.doc
North Shore Watershed Forum	Oct 30, 1997	DEP Office of Watershed Management
Open Space Residential Development: Four Case Studies	Jul 1, 2000	Metropolitan Area Planning Council Boston, MA
Park River/Essex Bay ACED Resource Inventory	Oct 16, 2000	MA Coastal Zone Management Gloucester, MA
Project Link: Riddle of the Sands-A volunteer water quality school project	Dec 1, 2001	Project Link Manchester, MA
Proposal for Public Education/Outreach Projects for Communities in the Town Line Brook Watershed	Apr 9, 2001	GeoSyntec Consultants, Boxborough MA
Proposal for Town Line Brook Watershed Study	Nov 17, 2000	GeoSyntec Consultants, Boxborough MA
Proposal Guidelines for Brownfields Assessment, Revolving Loan Fund, and Cleanup Grants	Oct 30, 2003	EPA fy04_proposal_guidelines_Brownfields.pdf
Protecting Building Utilities From Flood Damage	Nov 30, 1999	FEMA FEMAProtectingUtilitiesFloods.pdf

Protecting Natural Wetlands: A Guide to Stormwater Best Management Practices	Oct 30, 1996	EPA Protecting_Natural_Wetlands_ Stormwater_BMP.pdf
Request for Determination of Insignificance-Response to DEM Comments Essex, MA	Sep 1, 2001	URS Corporation Boston, Massachusetts
Request for Responses 604(b) Water Quality Management Planning Program Grants (FY03)	Oct 15, 2002	Executive Office of Environmental Affairs & MA-DEP OLD_604(B)RFR.pdf
Resource Management Plan Guidebook	Feb 28, 2000	Department of Interior Bureau of Reclamation BuRecGuide.pdf
Rockport, MA Water Supply Development Project Supplemental Environmental Impact Report EOEA #4293	Nov 14, 1997	Metcalf & Eddy Wakefield, MA
Salisbury, MA Industrial Park Sewer Extension: Final Environmental Impact Report	May 1, 2002	Weston & Sampson Engineers, Inc Peabody, MA
Saugus River Flood Control Improvements	Mar 30, 1992	Camp Dresser & McKee Inc. Cambridge, MA
Saugus River Thermal Impact Study	Jun 1, 2000	Capstone Environmental, Inc
Saugus River Watershed Council: 2002 Fish Spotter Program (Volunteer handouts)	Mar 9, 2002	Saugus River Watershed Council
Saugus River Watershed: Water Quality Report 1998-2000	Aug 15, 2001	Saugus River Watershed Council
Sewer System Evaluation and Wet Weather Overflow Study (Saugus, MA)	Jul 1, 1999	Camp Dresser & McKee Inc. Cambridge, MA
Sites of Concern: North Coastal Watershed, Massachusetts (Instruction Manual)	Feb 28, 2001	Daylor Consulting Group, Inc. Braintree MA
Source Pollution Investigation in the Forest River Watershed -Final (Salem, MA)	Aug 20, 2000	Metcalf & Eddy Wakefield, MA
State of the Sound: Current Knowledge and Future Directions (Symposium Report)	Jun 30, 2000	Salem Sound 2000, Inc.
Targeting and Eliminating Untreated Sewage Discharges: 00-08 Massachusetts Watershed Initiative North Coastal Watershed (2 copies)	Jun 30, 2001	URS Corporation Boston, Massachusetts
Task 2 Report-Sewage Facility Plan MEPA Special Procedures Report	Mar 30, 2000	Dames & Moore, Inc. Melrose, MA
The MA Unpaved Roads BMP Manual	Dec 30, 2001	Berkshire Regional Planning Commission Pittsfield, MA dirtroad.pdf
The State of Our Environment	Apr 1, 2000	Commonwealth of Massachusetts Executive Office of Environmental Affairs
Town Line Brook Hydrologic Study Document Bibliography	Mar 30, 2001	GeoSyntec Consultants, Boxborough MA
Transferable Development Rights: Using Market Forces and Master Planning to Manage Growth and Environmental Quality	Feb 28, 2001	EPA New England EPATransferableDevelopmentRights.pdf
Water Desalination: Findings and Recommendations	Oct 30, 2003	Department of Water Resources Sacramento, CA DESAL_IN_CA_ Findings-Recommendations.pdf
Watershed Protection: A Statewide Approach	Aug 1, 1995	Assessment and Watershed Protection Division Office of Wetland, Oceans and Watersheds U.S. EPA Washington, DC

Appendix P: Glossary

Some commonly-used terms and acronyms and their definitions:

303d – 303 d refers to a section in the federal Clean Water Act requiring all states to submit, biennially to the EPA, a list of waterways not meeting assigned water quality standards. The 303 d is a list of the known impaired waters in a state or on tribal lands.

319 grant – Section 319 of the Clean Water Act authorizes the awarding of EPA funds for Nonpoint Source Grants that promote the development and implementation of watershed-based plans and NPS pollution reduction. The grants are administered in Massachusetts by MA DEP, and are proposed in the early months of each calendar year.

604b grant –Section 604b of the federal Clean Water Act authorizes the awarding of EPA funds for water quality assessment and management planning grants. The grants are administered in Massachusetts by the MA DEP, and are proposed in the late months of each calendar year. A 319 grant may be used to implement the plan from a 604b grant – the distinction is that 604b grants are planning and 319 grants are implementation.

8T&B – Eight Towns and the Bay, a watershed group based around Cape Ann, www.naturecompass.org/8tb/

ACEC – Areas of Critical Environmental Concern are places in Massachusetts that receive special recognition because of the quality, uniqueness and significance of their natural and cultural resources. ACECs are nominated by local environmental groups, designated by the EOEA Secretary, and administered by DCR (DEM).

ACOE – U.S. Army Corps of Engineers (or COE).

Agricultural Protection Restrictions – Similar to a conservation restriction, Chapter 132A § 31 allows the state to purchase an Agricultural Preservation Restriction on farmlands, restricting use of the land to agricultural activities.

Anadromous: Fish that breed in fresh water but live their adult life in the sea. They spawn by running upstream.

APR --- Area for Preservation or Restoration or Agriculture Preservation Restriction

Aquifer – An underground geologic formation capable of holding large quantities of water in the (interstitial) spaces between rocks, sand and soil. Aquifers may serve as a source of drinking water.

ASMFC --- Atlantic States Marine Fisheries Commission

Bacteria – Microscopic one-celled organisms found everywhere. Some bacteria have the potential to be a public health threat. In Massachusetts there are defined limits for a specific bacteria, (fecal coliform) in water bodies.

Bacterial Contamination – Water with levels of indicator bacteria exceeding state or federal standards. Indicator bacteria are used as a proxy for the presence of pathogens that may pose a public health threat because of their relative simple and cost effective testing methods.

Basin – A topographic designation based on drainage patterns. The water flowing within a basin (or watershed) eventually flows to one common point. The state has been divided into 27 major basins under the Watershed Initiative.

Best Management Practices (BMPs) – Techniques which may be nonstructural, structural or managerial capable of effectively and economically reducing nonpoint sources of pollution.

Biomonitoring – Examining the biological (living) communities in a given body of water (or other habitat) to determine the complexity, diversity, and species composition in the water body. This information helps assess the overall health of the habitat.

BOD --- Biological Oxygen Demand (a measure of waterway health).

Board of Health (BOH) – In Massachusetts it is the local board responsible for health issues in the community including septic systems. It is usually a volunteer board.

Buffer – An area of no or limited activity along a water way functioning as a filter of pollutants contained in runoff, a wildlife corridor, flood plain, and several other benefits.

Bylaws – Local regulations passed by a community.

CCMP --- Comprehensive Conservation and Management Plan

CERCLA --- Comprehensive Environmental Response Compensation and Liability Act (Federal)

CFIP --- Coastal Facilities Improvement Program

Chapter 61 – A manner by which lands can be classified as Forest Lands in a process overseen by the MA Department of Environmental Management. Lands certified as Forest Lands are taxed, at a special rate, according to provisions established in Chapter 61. Chapter 61A is the section of Chapter 61 applicable to agricultural and horticultural lands and 61B is the section dealing with recreational lands eligible for special tax assessments.

Class A, B, C water quality standards – Under the Federal Clean Water Act, each state must establish specific water quality classifications with defined water quality criteria. In Massachusetts waters are assigned an A, B or C classification. A waterway's classification reflects the water quality needed for the designated uses of a given water body (the waterways potential) and not the existing water quality.

Class B water – A waterway classified by the state as being capable of meeting the following water quality level, "suitable habitat for fish, other aquatic life and wildlife, and primary and secondary contact recreation. Can be used, when so designated, as drinking water with proper treatment and for agriculture and industry and good and consistent aesthetic value."

Clean Water Act (CWA) – A federal law establishing comprehensive national policies for water quality management. The essence of the CWA is to have all US waters "fishable and swim able".

Cluster zoning – A relatively new development method that places buildings in close proximity to each other, (a cluster) while maximizing the amount of contiguous open space and preserving the most sensitive natural habitats. Cluster zoning requires a variance in most communities.

CNPSP --- Coastal Nonpoint Source Program (Federal)

Community Preservation Act – In 2000, the Community Preservation Act (CPA) was passed in Massachusetts providing the opportunity for communities to choose to establish a local fund to be used for open space protection, historic preservation and the creation of low and moderate income housing. To establish a fund, communities must pass by referendum a property tax of up to 3% dedicated to their Community Preservation Fund.

Conservation agent – An individual hired by a community to administer the wishes and rulings of the Conservation Commission, assist proponents with aspects of the Wetland and Rivers Protection Acts, oversee and enforce projects falling under jurisdiction of the ConComm, and serve as a liaison to other community boards.

Conservation Commission (ConComm) – A volunteer board within a Massachusetts community responsible for administering the Wetland Protection Act and the River Protection Act. ConComms are charged with upholding the tenets of the law, conducting public hearings, writing conditions for a proponent to follow to avoid harm to resource areas, and overseeing any local wetland bylaws. They are also responsible for community open space held as conservation title lands.

CSO --- Combined Sewer Overflow

Cultural Eutrophication – When the natural process of eutrophication, growth and decay in an aquatic ecosystem, is accelerated by an increase of nutrients derived from societal sources such as lawns, roads, wastewater, and stormwater runoff.

CZM – the federal Coastal Zone Management Act (or CZMA), administered by the National Oceanic and Atmospheric Administration (NOAA), awards and administers grants for coastal projects. Also, the Massachusetts CZM office (see MCZM-NS), administered by EOEA.

DCR – the Massachusetts Department of Conservation and Recreation, the state agency responsible for managing parks and recreational areas. (Merged MDC and DEM).

DCS --- the Massachusetts Division of Conservation Services

DELE --- the Massachusetts Division of Environmental Law Enforcement

DEM – the old Massachusetts Department of Environmental Management, the old name for the Massachusetts Department of Conservation and Recreation (DCR). DEM was merged in 2003 with the Metropolitan District Commission (MDC) to form the new DCR.

DEP – the Massachusetts Department of Environmental Protection, the state agency responsible for enforcing environmental regulations, and for administering EPA 319 and 604b grants.

DEQE --- the Massachusetts Dept. of Environmental Quality Engineering (Predecessor Agency to DEP)

DFA – the old Massachusetts Department of Food and Agriculture, now the Massachusetts Department of Agricultural Resources (MDAR).

DFG – the Massachusetts Department of Fish and Game (formerly DFWELE).

DFWELE – the old Massachusetts Department of Fisheries, Wildlife and Environmental Law Enforcement, now the Massachusetts Department of Fish and Game (DFG).

Diagnostic / Feasibility – A method used to assess the ecological health of lakes or ponds and specify management and corrective actions.

Division of Conservation Services Self Help Funds – The Division of Conservations Services is within the Executive Office of Environmental Affairs. The Self Help Funding program is charged with helping communities acquire or protect, through conservation restrictions, land for the protection of wildlife, habitat, and unique cultural, historic or natural resources and for passive recreation. Lands may include forests, water resources, and farmlands. Land purchased with the help of these funds must be open to the public.

Ecoregion – A geographic area with a unique assemblage of ecological characteristic, (soil, climate, geology and vegetation) making it distinct from another area.

Ecosystem integrity – The ability of a natural system to function suitably. An important component in its ability to function as a viable ecosystem is the presence of native species in balanced amounts and synergistic relationships between the individual components of the ecosystem (plants, animals, physical parameters) as developed over eons of co-existence.

EEZ --- Exclusive Economic Zone (offshore designation)

Effluent – Wastewater as it leaves a treatment system. Examples are discharges from sewage treatment facilities or water used in an industrial cooling system.

EOEA – the Massachusetts Executive Office of Environmental Affairs, the state executive agency responsible for promulgating and administering environmental regulations.

EPA – the federal Environmental Protection Agency, which is responsible for promulgating regulations and enforcing the CWA, awarding grants under the Section 319 and 604b, and administering the federal Watershed Initiative, among other tasks.

Erosion – The accelerated removal of soils and earth by storm flows, alteration of topography and/or drainage, changes in flow patterns or mechanical disruptions (such as boat wakes). Signs of erosion can include gullies, undercut banks, slumping, and higher turbidity in adjacent waterways.

Eutrophic Pond – A pond receiving an excess of nutrients, especially phosphorus, from the surrounding watershed will experience a greatly accelerated rate of plant growth. Plant growth and decomposition is a naturally process but when the nutrients cause excessive growth the natural system is overwhelmed. The result is often thick plant and algae growth in a pond, loss of biodiversity, stressful conditions for aquatic life and the potential for complete collapse of the natural ecosystem.

Eutrophication – Eutrophication is the natural process of nutrients entering a water body resulting in increased biological activity. The natural processes may be accelerated and intensified by human activities that cause excessive quantities of nutrients to flow into a water body leading to unchecked growth of aquatic plants, subsequent depleted oxygen levels and in some cases the collapse of the aquatic ecosystem and the premature succession of the area a wetland or upland.

Executive Order 418 – Governor Swift instituted this Executive Order to promote the development of new housing in a sustainable manner. The state provided $30,000 worth of services to communities requesting help with the

drafting of a comprehensive plan encompassing housing, environmental issues, transportation needs and economic growth.

FOLQ – Friends of Lake Quannapowitt, a watershed group based in Wakefield, www.wakefield.org/folq/

Forest and land management – The practice of creating a plan for the long-term management of a forest or area of land that is sustainable and protective of natural ecosystems.

Geographical Information System (GIS) – A relatively new and useful computer-based system allowing the creation of 'data layers' that may be overlain to create customized maps with specific information. Examples of data layers include open spaces, watershed boundaries, topography and land use.

Habitat – A space providing the components a species needs to survive. For plants, habitat needs involve soil, water, sunlight, and climate while animals need a habitat that also provides shelter and food.

HMGNE --- Historic Maritime Group of New England

Hydrology – The study or science of water behavior (occurrence and movement) in the atmosphere, on the surface of the planet and below the surface.

Impervious Surface – A surface that does not allow water to penetrate such as pavement.

Imperviousness – The degree to which water can seep through a surface.

Industrial discharge – Discharges of wastewater (it may be treated contact water or untreated non-contact process or cooling water) from an industrial facility into the waters of the United States. Industrial discharges are regulated under a provision of the federal Clean Water Act and must obtain a permit (NPDES) to discharge.

Interbasin Transfer – A transfer of water from one basin/watershed into another. These transfers are regulated in Massachusetts under the Interbasin Transfer Act.

Invasive species/plants – These are plants or animals able to quickly and easily populate an area or habitat. They are usually very adaptable and can take advantage of and tolerate disturbed or unstable conditions. The end result is typically a loss in natural diversity in the area and diminished value as habitat for birds, animals and native species.

ISSC --- Interstate Shellfish Sanitation Commission

Land use – The activity occurring on a given parcel or land. There is an existing system for characterizing land use into categories such as open space, residential-single family ¼ acre, or urban. Associated with these land use categories are characteristic such as amount of traffic generated or pollutant loads that can assist in planning and modeling .

Leachate – Material, usually liquids, leaking from a disposal area, underground storage unit or poorly designed storage area. Leachate may or may not contain pollutants or hazardous substances.

LID -- Low Impact Development – accounting for runoff, non-point source pollution, etc. in permitting and development planning.

LWSC – Lynn Water and Sewer Commission.

MACC --- Massachusetts Association of Conservation Commissions

MA Scenic River Protection Act – [Chapter 21A §2(28)] Administer by the MA Department of Environmental Management, the Scenic and Recreational Rivers Act allows for the designation or rivers or river sections as scenic and recreational rivers. Designated rivers have orders put in place to preserve and promote public safety, health and welfare, protect public and private property, wildlife, freshwater fisheries and irreplaceable wild and scenic recreational river resources.

Macroinvertebrate (sampling or inventory) – Macroinvertebrates are small, but visible with the naked eye, animals without backbones (insects, worms, larvae, etc.). Water bodies have communities of aquatic macroinvertebrates. The species composition, species diversity and abundance of the macroinvertebrates in a given water body can provide valuable information on the relative health and water quality of a waterway.

MAPC – Metropolitan Area Planning Council, the regional planning council covering most of the NCW.

MassGIS --- Massachusetts Geographic Information System

MBP --- Massachusetts Bays Program

MCZM-NS -- Massachusetts Coastal Zone Management Program's North Shore Region – a federally-established program administered by EOEA – see CZMA.

MDAR – the Massachusetts Department of Agricultural Resources, formerly the Department of Food and Agriculture (DFA).

MDC – the old Metropolitan District Commission, the old name for DCR's Division of Urban Parks and Recreation.

MDMF – the Massachusetts Department of Marine Fisheries.

MFCMA --- Magnuson Fishery Conservation and Management Act (Federal)

MGD – Million Gallons per Day, a measure of water flow.

MGL --- Massachusetts General Laws

Mixed use development – A planning philosophy that does not segregate uses, (residential, retail, commercial, industrial) but opts for a complementary mix of uses. For example, this approach would allow retail on a first floor, office space above and apartments on the upper most floors.

MWI – The Massachusetts Watershed Initiative. An EOEA-run program which established Watershed Teams in 27 watersheds statewide, with a dedicated staff person assigned as Watershed Team Leader in each watershed. The MWI was dissolved in February 2003 but EOEA still applies the goals and methods of the program. MWI awarded annual grants for watershed projects – some grants are still available through the EPA Watershed Initiative.

MWRA --- Massachusetts Water Resources Authority

National Pollution Discharge Elimination System (NPDES) – A federal program under the Clean Water Act created to monitor, regulate and oversee discharges, such as sewage treatment plant effluent, storm water and industrial discharges, into US waterways.

Natural resources/habitat inventory – An assessment and concerted examination of the natural communities, natural amenities and ecosystems in a given area.

NCW – the North Coastal Watersheds, comprising the coastal area from Revere to Cape Ann, Essex, and Salisbury, and the rivers that drain directly to that coast.

NGO – Non-governmental organization (also NPO, not-for-profit organization).

Nitrate – A form of nitrogen readily usable by vegetation. Excessive amounts of nitrate can disrupt ecological balances in a natural system, particularly in salt water and pose some public health threats.

NMFS --- National Marine Fisheries Service (Northeast regulatory headquarters in Gloucester)

NMSP --- National Marine Sanctuary Program (local sanctuary is Stellwagen Bank)

Non-native plants – Plants from another region or continent introduced to an area. Non-native plants usually do not have the same checks and balances in place, as is the case with native species, and the result is often rampant invasion and excessive growth by the non-natives (hence the term "invasive species"). Areas dominated by these plants may not be useful to native species for food, shelter or habitat and usually displace the native plant community.

Nonpoint Source Pollution (NPS) – Pollution originating from multiple and diffuse sources with varying loads. Storm water is a significant contributor of nonpoint pollutants since it washes pollutants from impervious surfaces such as roadways.

NPDES – National Pollutant Discharge Elimination System, a permitting program by EPA to control water pollution by regulating point sources that discharge pollutants into waters. NPDES does not apply to non-point source pollution, except for stormwater permits (which is an NPS pollutant).

NPS – National Park Service (also non-point source pollution, above). The Saugus Iron Works National Historic Site is a 9-acre National Park Service site along the Saugus River in the NCW.

Nuisance species – A plant or animal prone to causing problems in ecosystem function or to the health, enjoyment, or aesthetic value of an ecosystem.

Nutrients, (nitrates and phosphates) – Nutrients are essential for growth in both plants and animals with nitrogen and phosphorus being significant for growth in plants. There are several common forms of nitrogen including nitrite, nitrate, and ammonia. Nitrate is a form of nitrogen easily absorbed and used by plants and is a byproduct of the oxidation of ammonia. Phosphate usually occurs in low concentrations in water and plant growth in fresh water is limited by the amount of phosphate present in the water.

On-site Systems – An individual system for treating wastewater, commonly called a septic system.

Open Space and Recreation Plan – A short and/or long term plan compiled by a community identifying current open space and parklands with a blue print for future acquisitions, changes and enhancements based on an assessment of community needs, habitat and sensitive resources. Up to date open space plans are often a requirement for a community to access some state and federal self-help funds.

OWM --- Office of Watershed Management (Mass./DEP)

OWOW --- Office of Wetlands, Oceans and Waterways (Federal/EPA)

Phosphorus – A nutrient often serving as the limit to growth in freshwater systems. Excessive amount of phosphorus in a water body can lead to a condition of unchecked plant growth known as eutrophication.

Rails to Trails – The conversion of inactive railroad beds and rights-of-way into trails for recreation and passage.

RFP --- Request for Proposals (also RFR, Request for Reponses, or RFQ, Request for Quotations)

Riparian zone or area – This is the land adjacent to and along a river or stream. When a riparian area has a natural vegetative cover it serves a buffer between the upland and watercourse.

River Protection Act (RPA) – An augmentation to the Massachusetts Wetland Protection Act creating a 200-foot river resource area around most of the perennial rivers and streams in Massachusetts, (some densely developed communities have a 25-foot riverfront area) to better protect the quality of our river resources. The RPA expands the scope of jurisdiction of the Wetland Protection Act.

Run-off – The water flowing off pavement, roofs, lawns and other surfaces during a storm event often carrying pollutants washed from these surfaces.

Safe Drinking Water Act (SDWA) – A federal law passed in 1974 creating a federal program to monitor and increase the safety of drinking water. Amended in 1986 to establish new enforcement responsibilities for EPA and changes in nation-wide safeguards.

SBNMS --- Stellwagen Bank National Marine Sanctuary

Scenic River Protection – [Chapter 21A §2(28)] Administer by the MA Department of Environmental Management, the Scenic and Recreational Rivers Act allows for the designation or rivers or river sections as scenic and recreational rivers. Designated rivers have orders put in place to preserve and promote public safety, health and welfare, protect public and private property, wildlife, freshwater fisheries and irreplaceable wild and scenic recreational river resources.

Sedimentation and siltation – An increase, above natural levels, in the amount of sand and silt carried to a watercourse. This increase can lead to impairments including loss of habitat, loss of spawning areas, decrease in light penetration, increase in scour and an increase in bacterial and other pollutants.

Septic systems/ on-site systems – These are decentralized waste treatment systems usually installed for an individual or cluster of houses. A septic system replaced the historic practice of direct discharges of wastes to water bodies and provides an adequate level of treatment and contributes to groundwater recharge when designed, installed and maintained properly on suitable soils.

SRWC – Saugus River Watershed Council, a watershed group based in Saugus, www.saugusriver.org

SSCW – Salem Sound Coastwatch (formerly SS2000, Salem Sound 2000), a watershed group based in Salem, www.salemsound.org

State Revolving Fund (SRF) – A fund from which a community can apply for zero interest loans to assess or improve wastewater or nonpoint source pollution problems in the community.

Storm water Phase 2 Requirements – Storm water controls are found in a section of the federal Clean Water Act regulating pollutant discharges to waterways (NPDES). Phase 2 is an effort to reduce the pollution sources entering

waters via storm water runoff from medium sized municipal areas. Areas meeting the size or density requirements will have to develop and implement a storm water management plan encompassing six minimum control measures under a general permit issued under the auspices of the Clean Water Act.

Stream Team – A group of volunteers focusing effort and energy on a specific stream or reach of a river. Stream teams may undertake one or more of a variety of initiatives such as shoreline visual surveys, river cleanups or educational outreach.

Subdivision standards – The ordinances and requirements enacted by a community to govern proposed subdivisions. Standards could involve density of development, road and sidewalk design, water use, turf management, and more.

Surface and ground water – Surface water is all water at or above the ground's surface. Often the most concerned lies with fresh water because of the world's heavy reliance on surface water for drinking and other uses. Ground water is the fresh water found beneath the surface of the planet in the spaces between soil particles, bedrock faults/cracks, etc. Ground water, particularly the water found in aquifers, is also an important source of drinking water.

SWIM -- Safer Waters in Massachusetts, a watershed group based in Nahant (also Nahant SWIM, Inc.), www.nahant.org/community/swim.shtml

TIE/TRE – Toxicity Identification and Toxic Reduction Evaluation.

Title 5 – The Massachusetts regulation overseeing on-site wastewater treatment systems. Improperly or poorly functioning on-site systems (Septic Systems) have the potential to adversely impact nearby waterways or groundwater.

Total Maximum Daily Load (TMDL) – A section in the Federal Clean Water Act requiring each state to identify water bodies that are not meeting their assigned water quality standard, ascertain the causes of impairment and determine the maximum amount of that pollutants a waterway can receive, yet still meet water quality standards. Using this amount, a TMDL establishes the allowable pollutant loading from all contributing sources so the total, including a margin of safety, falls at or below the maximum daily allowable pollutant load.

Total Phosphorus – Phosphorus is a nutrient essential for the growth of most plants. Phosphorus can be found in both the organic and inorganic forms. Total phosphorus is a measure of both these forms.

Tributary – A stream or river flowing into a larger, mainstream river.

Underground Storage Tanks (USTs) – These are storage tanks buried beneath the surface of the ground. These tanks frequently contain gasoline (such as those at service stations or airports), home heating oil or other petroleum products. USTs are relatively inaccessible and are difficult to monitor for leaks, (LUSTs or leaking underground storage tanks) posing a threat to groundwater and surface waters.

Wastewater – Water that is used for some purpose then discharged or "wasted". Usually refers to the water used in households, business and industry.

Water Management Act – (MGL Chapter 21 G) The intent of the WMA is to manage water uses, maintain safe yields, and plan for future water needs and this is done through the issuance of permits to withdraw set volumes of water from ground and surface supplies. The MA Dept. of Environmental Management administers the WMA based on decisions made by the Water Resources Commission.

Watershed – An area of land contributing runoff/drainage to a common point. Large watershed may be divided into smaller sub-watersheds.

Wetland resource area – An area of land with saturated or nearly saturated soils most of the year serving as an interface between land-based and water-based environments. Wetlands provide many benefits including pollution attenuation, groundwater recharge, valuable plant and animal habitat. Wetlands are protected under the Massachusetts Wetland Protection Act as resource areas.

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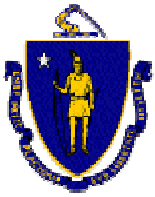

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